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1961–62

PART I

NATIONAL MUSEUM OF CANADA
Bulletin No. 193

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PART I

Issued under the authority of
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Secretary of State

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FOREWORD

It is gratifying to record that since assembling the preceding bulletin of this series (Contributions to Anthropology 1960, Part I, Bull. No. 180), the National Museum of Canada has published in archaeology and physical anthropology: "The Donaldson Site" (Bull. No. 184) by J. V. Wright and J. E. Anderson; Anderson's "The Human Skeleton: A Manual for Archaeologists"; and two Anthropology Papers which give preliminary accounts of archaeological work done in British Columbia and Ontario. During this same time staff members have published many papers and book reviews in professional journals. Anthropology Papers now in the process of publication include archaeological studies of Manitoba mound sites, a prehistoric Huron village in Ontario, an early Woodland site in Quebec, and an Archaic site near Pembroke, Ontario. In press as a separate bulletin is Elmer Harp's 1952 study of the Dorset culture in Newfoundland.

Looking to the further future, manuscripts for three bulletins are nearing completion by staff members: W. E. Taylor on Dorset and pre-Dorset relations in the Canadian Arctic; J. V. Wright on the origins of the Ontario Iroquois; and L. Oschinsky on Eskimo physical anthropology. A fourth manuscript of bulletin size is being completed by W. J. Mayer-Oakes and Z. Pohorecky to report an archaeological survey in the South Saskatchewan River Valley; the field work was supported in part by a National Museum of Canada contract.

Referring to the authors and papers of this bulletin, J. Pendergast's report on three prehistoric Iroquois sites in southeastern Ontario is completed and will soon go to press as a bulletin. Contract support has been provided to J. E. Anderson to prepare a report on osteological variation in prehistoric Canadian populations. Also in 1963, continuing contract support has been provided Father G.-M. Rousselière for salvage work at Button Point on Bylot Island, N.W.T. Plans are being made to facilitate D. Sanger's continuing work in 1964 in the area of EdRk-4 in southern British Columbia.

As I write in the summer of 1963, the museum has, or is co-sponsoring, three archaeological parties in British Columbia, two in Manitoba, two in Ontario, three in Quebec, one in Nova Scotia, and two in the central and eastern Canadian Arctic. Perhaps of greater consequence than any of these, the National Museum of Canada is initiating, by contract and with the co-operation of the University of Michigan Memorial-Phoenix Project, a radiocarbon dating program to attack chronological problems in Canadian prehistory. Present plans call for a continuation of this pilot program for three years.

OTTAWA, JUNE 1963

W. E. TAYLOR, Jr.
Chief Archaeologist

CONTENTS

PAGE

The Payne Site, by James F. Pendergast.......... 1

The People of Fairty, by J. E. Anderson.......... 28

Excavations at Nesikep Creek (EdRk:4), by David Sanger.......... 130

Palaeo-Eskimo remains in the Pelly Bay Region, N.W.T., by G.-M. Rousselière, O.M.I.......... 162

Evidence of Boreal Archaic Culture in southern Labrador and Newfoundland, by Elmer Harp, Jr.......... 184

Illustrations

PAPER NO. 1:

Figure 1. Air photo of the site, annotated to show areas excavated.......... 2
2. Cross-section of the Midden excavated in 1952.......... 3
3. A speculative sequence of Ontario Iroquois components.......... 16

Appendix: Tables 5–9.......... 23–27

PAPER NO. 2:

Plate I. Norma frontalis and lateralis of Skull 24 with associated mandible.......... 65
II A. Norma verticalis of an adult skull with a persisting metopic suture.......... 67
B. Anterior view of a frontal bone showing double supraorbital foramina and multiple grooves in the bone above them for branches of the supraorbital vessels and nerve.......... 67
III A. Norma lateralis of a skull which has a round, discrete, new growth of bone on the posterior part of the squamous temporal.......... 69
B. The left side of the base of a skull showing arthritic changes in the jaw joint.......... 69
C. A detailed view of the anterior part of the foramen magnum of a skull having a precondylar tubercle.......... 69
IV A,B,C. Three types of variation in bony bridges occurring in the region of clinoid processes of the sphenoid bone.......... 71
V A,B. Two examples of os inca.......... 73
VI A. Norma occipitalis of a skull having a large accessory bone at the site of the posterior fontanelle.......... 75
B. Norma occipitalis of a skull in which the lambdoid suture bulges anteriorly near the midline.......... 75
C. A detailed view of the lambdoid region of a skull.......... 75
VII A. Occlusal view of the maxillary dentition of one specimen showing a smooth, rounded dental arch with moderately advanced attrition resulting in an edge-to-edge bite.......... 77
B. An amorphous segment of mandible forming an osteomyelitic sequestrum.......... 77
C. A fragment of maxilla bearing a peg-shaped lateral incisor tooth.......... 77
VIII A. Superior view of an atlas vertebra showing a bony bridge passing from the posterior arch to the superior articular process, forming a tunnel for the vertebral artery.......... 79
B. Two defects of ossification on atlas.......... 79
C. Left side of atlas showing a spur bone projecting from the posterior arch surrounding vertebral artery area, but failing to meet superior articular facet.......... 79
IX A,B. Two examples of spina bifida.......... 81
X A. Three varieties of spinous process on the axis vertebra.......... 83
B. Posterior view of an axis vertebra.......... 83
C. Superior view of the right fragment of an atlas vertebra.......... 83

PAPER NO. 2 (*Cont.*) PAGE

XI A. A young cervical vertebra showing a large defect in the centrum..... 85
B. A cervical vertebra with a double foramen transversarium on each side 85
C. An oblique view of a thoracic vertebra showing a compression fracture of the vertebral body.................................... 85
D. Marked osteophytosis and ossification of the anterior longitudinal ligament on a lumbar vertebral body...................... 85

XII A. A view of an atlas vertebra from behind showing extensive peripheral lipping of the articular facet for the dens................... 87
B. Side view of a second and third cervical vertebra, fused together at their bodies and at their apophyseal joints........................ 87
C. The inferior surface of a cervical vertebra showing degenerative changes of the body and of the left articular facet.................. 87

XIII A. A left cervical rib fused to the seventh cervical vertebra............ 89
B. The body of a lumbar vertebra with smooth-walled cavities eroding its interior... 89

XIV A,B. Two cases of massive infection in the vertebral region.............. 91

XV A. Two adjacent thoracic vertebrae fused together by the huge node-like union of osteophytes from the periphery of their bodies......... 93
B. Two adjacent thoracic vertebrae, fused together both by lipping at their bodies and by arthritic changes at the apophyseal joints.. 93

XVI A,B. An example of spondylolysis of a lumbar vertebra................ 95

XVII A. Complete sacralization of the fifth lumbar vertebra............... 97
B. Hemisacralization of the fifth lumbar vertebra................... 97

XVIII A. Posterior view of a sacrum in which the sacral hiatus extends upward to the level of the second posterior sacral foramen............ 99
B. A distorted coccyx whose lower segments deviate markedly to the right side.. 99

XIX A. A sternal foramen at the junction of the third and fourth sternebrae.. 101
B. A developing sternebra showing its origin from multiple asymmetrical centres of ossification................................... 101
C. Anterior view of a manubrium with ossification and fusion of the first left costal cartilage.. 101

XX A. Posterior view of a left scapula................................ 103
B. Ossification of the suprascapular ligament producing a foramen on the superior border of the scapula............................. 103
C. Marked arthritic involvement of the glenoid fossa with flattening, erosion, and peripheral lipping.............................. 103
D. An adult scapula in which the epiphysis for the tip of the acromion has not fused.. 103

XXI A. A healed fracture of the neck of the humerus with distortion of the proximal end.. 105
B. Proximal end of a humerus in which the head has been destroyed perhaps from the effects of a septic arthritis..................... 105
C. The typical appearance of osteoarthritic involvement of the distal end of the humerus.. 105
D. A healed fracture of the distal end of the humerus with minimal displacement of the fragments............................... 105

XXII. Two anomalies of the humerus—
A *supratrochlear process* (A,B).............................. 107
A *septal aperture* (C,D)..................................... 107

XXIII A. An adult ulna with marked bowing of the distal one-third of the shaft 109
B. A healed fracture of the shaft of the ulna........................ 109
C. The proximal end of the left ulna.............................. 109
D. A healed fracture of the distal end of the radius with considerable deformity at the wrist joint.............................. 109

PAPER No. 2 (*Conc.*) PAGE

XXIV A. A V-shaped slit in the upper part of the articular surface of the acetabulum ... 111
B. A fragment of innominate bone showing an acetabulum grossly distorted from the effects of osteoarthritis ... 111

XXV A. The proximal end of a young humerus showing the effects of osteomyelitis, with involucrum formation and two cloacae ... 113
B. The proximal end of an adult femur showing distortion of the greater trochanter ... 113
C. Osteoarthritis of the head of the femur with erosion and marked peripheral lipping ... 113
D. An adult femur with flattening of the head to the "mushroom" form characteristic of Legge-Perthe's disease ... 113

XXVI A. An ossified subperiosteal hematoma on the shaft of a femur ... 115
B. Osteomyelitis of the shaft of the femur with a draining sinus ... 115
C. A posterior view of the distal end of a femur ... 115
D. An example of Brodie's abscess ... 115

XXVII A. The proximal end of a young femur with epiphyses just beginning to fuse ... 117
B. A somewhat older femur in which the epiphyses have fused ... 117

XXVIII A. A further stage in the formation of the neck of the femur ... 119
B. An older femur in which compact bone covers the previously exposed area of cancellous bone ... 119

XXIX A. Posterior view of a right bipartite patella showing a defect in the upper lateral region ... 121
B. Anterior view of a patella showing spurs of bone extending both superiorly and inferiorly from this surface ... 121
C. Posterior surface of a patella with marked evidences of osteoarthritis 121
D. Posterior view of a patella showing the characteristic early sign of bony involvement from osteoarthritis ... 121

XXX A. Osteomyelitis of the distal end of a tibia with a large draining sinus .. 123
B. Periostitis of the distal end of a tibia ... 123
C. The shaft of a fibula with periostitis and localized ossification into fibrous tissue ... 123
D. The distal end of a fibula with osteoarthritic changes at the ankle joint ... 123

XXXI A–D. Variations in the appearance of the upper surface of the talus due to extensions of the joint surfaces, the so-called "squatting facets". 125

XXXII A–E. Variations in the anterior and middle facets of the calcaneus ... 127

XXXIII A. An osteophyte near the proximal end of a metatarsal ... 129
B. The first metatarso-phalangeal joint fused in flexion and showing considerable lipping and distortion ... 129
C. Osteomyelitis of a cuboid with cavity formation ... 129
D. Fusion of two cuneiforms ... 129

Figure 1. Age distribution ... 33
2. The lengths of tibia and humerus ... 35
3. Dimensions of the femur ... 36
4. Humeral head diameters ... 38
5. Patellar module and axis height ... 39
6. Pathology and variations in the foot ... 54
7. Degenerative disease of vertebrae ... 56
8. Distribution of osteoarthritis ... 58
9. Summary of cranial characteristics ... 61
10. Infracranial variation ... 62

PAPER NO. 3:

PAGE
Plate I. Zone VI—The White Silt Deposit. Looking West 134
II A–J. Selected artifacts from Zone I 151
III A–V. Selected artifacts from Zone III 153
IV A–M. Selected artifacts from Zone IV 155
V A–T. Selected artifacts from Zone V 157
VI A–Z. Selected artifacts from Zone VII 159
VII A–N. Selected bone, shell, and antler artifacts from various zones . . . 161
Figure 1. Map of the Nesikep-Lochnore Creek Area of south-central British Columbia 130
2. Profile of East 20 Wall from North 8 to North 11 133

PAPER NO. 4:

Plate I. Artifacts 183
Figure 1. The southeast part of Pelly Bay 163
2. St. Mary's Hill. Overall sketch map 165
3. St. Mary's Hill, Feature 1 166
4. St. Mary's Hill, Features *k* and *25* 167
5. St. Mary's Hill, Feature *m* 169
6. St. Mary's Hill. Various stone alignments 172
7. St. Mary's Hill, Features *2*, *n.g.* 175
8. Kugarjuk IV 177
9. Kugarjuk II 179

PAPER NO. 5:

Plate I. Artifacts, a–t, BS-1 and BS-2 207
II. Artifacts, a–n, BS-4,-5,-6 209
III. Artifacts, FB-1, a–n 213
IV. Artifacts, FB-3, a–o 217
V. Artifacts, FB-3, a–o 221
VI. Artifacts, FB-3,-4, a–m 223
VII. Artifacts, Loup-1,-2, Diable-1,-2, a–w 227
VIII. Artifacts, a–u, Modeste-1,-2,-3, and Pinware W-2,-3,-5 229
IX. Artifacts, Pinware E-2, a–k 235
X. Artifacts, Ireland Bight, Gold Cove-1 and -2, a–g 237
XI. Artifacts, Brown's Cove, Deer Lake, Port au Choix-3, Woody Point, a–j 241
XII. Artifacts, Port au Choix-3, -9, a–g 243
Figure 1. General area map 188
2. Blanc Sablon, P.Q. 189
3. Forteau Bay 191
4. (a) L'Anse à Loup; (b) L'Anse au Diable 195
5. West St. Modeste and Pinware Bay 198
6. Comparative elevations of coastal sites 247
7. Comparative soil profiles 249
8. Comparative soil profiles 250
Table 1. Distribution of artifact types 253

THE PAYNE SITE*

BY JAMES F. PENDERGAST

INTRODUCTION

The Payne Site[1] is located in the Province of Ontario, Prince Edward County, Township of Hallowell, on Lot 14 in the Second Concession Northwest of West Lake.[2]

My attention was drawn to the area in the spring of 1950 by Mr. Gordon Walmsley, Picton barrister, who suspected it to be of significance because of the notation "Indian fortification" on an 1832 land survey map in the Prince Edward County Registry Office, Picton. A preliminary reconnaissance of the area disclosed that the garden in the rear of the Payne farm buildings was littered with potsherds, bone fragments, fire-cracked rock, and similar debris indicative of aboriginal occupation. Inquiries indicated that the existence of the site was not generally known, nor had it been dug into within memory.

ACKNOWLEDGMENTS

I wish to thank J. N. Emerson, University of Toronto; J. R. Harper, National Gallery of Canada; T. E. Lee, Ottawa; F. Ridley, Toronto; W. A. Ritchie, New York State Science Service; and R. S. MacNeish, W. E. Taylor, and J. V. Wright, of the National Museum of Canada; for the encouragement and assistance, over a long period of time, which made this paper possible.

R. S. MacNeish's assistance in typing the rim sherds is gratefully acknowledged. I wish to thank Philip Youngman, mammalogist at the National Museum of Canada, for identifying the osteological remains. I also wish to thank Mrs. Alice Turnham, Curator of the Redpath Museum of McGill University, for the opportunity to examine pottery from the Hochelaga site.

THE SITE

The site (AlGh-2) extends over approximately two to three acres, part of which is covered by the Payne farm buildings. The major portion lies along the north slope of a low ridge of Athol Sandy Loam,[3] which runs roughly southwest and northeast through the area. At the foot of the slope is an unnamed creek which at this point is now little more than a spring freshet or a swampy area during the summer. It was probably the source of water for the occupants of the site, and it may have been large enough to serve also as a transportation route to the connecting waterways of West Lake and Lake Ontario some two or three miles to the south.

---

*In 1958 the Payne site was again excavated by a joint University of Toronto-National Museum of Canada party, directed by Dr. J. N. Emerson. When the ownership of the site changed after 1952, it was named McDonald (Emerson, 1960). Neither Dr. Emerson nor Major Pendergast knew of the other's work until Mr. W. E. Taylor had read their respective manuscripts. Dr. Emerson's McDonald site is Major Pendergast's Payne site. The authors have agreed to use the latter name for this site. Dr. Emerson is completing a report on his 1958 results for publication in the near future. W.E.T.

[1] The site is named after the then owner, Mr. Jos. Payne, whom I wish to thank for permission to dig and for the many courtesies he extended to me.

[2] Map reference 164736 on the Canada 1:50,000 map, Sheet No. 30 N/14, West Half, Wellington Sheet.

[3] "Soil Survey Prince Edward County," Dominion Department of Agriculture and Ontario Agricultural College, November 1948.

The general area has been cultivated since it was settled by the United Empire Loyalists, and the site itself has probably been cultivated during much of this time. It is known to have been intensively cultivated by the Payne family as a kitchen garden and berry patch for at least twenty years prior to 1950.

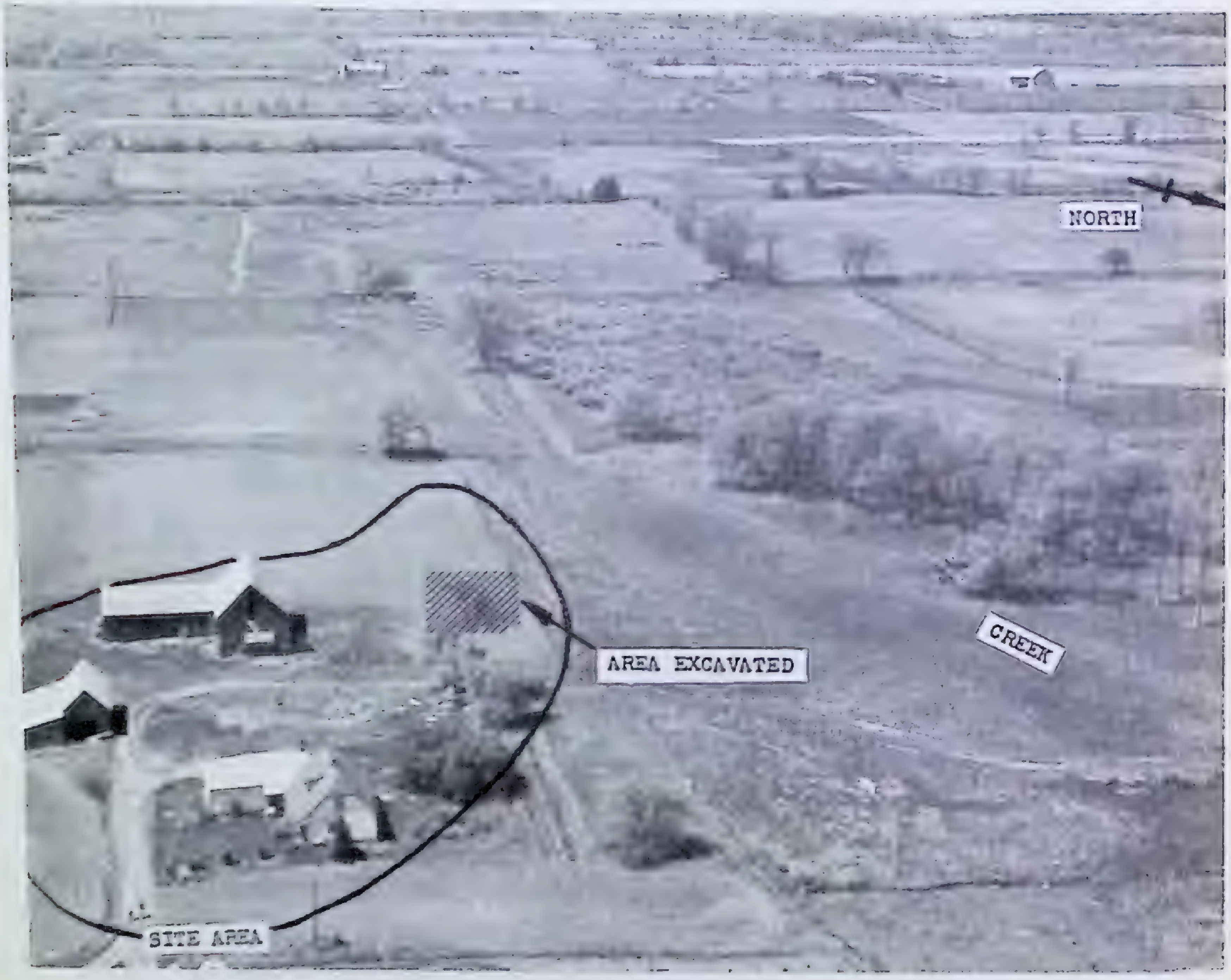

FIGURE 1. Air photo of the site, annotated to show the areas excavated

EXCAVATIONS

Preliminary to excavations in the summer of 1950, a surface collection was made, and the areas of artifact concentration were recorded as a guide to future operations. Since the areas of heavy surface concentration lay in the intensely and long cultivated garden area, indeed in the midst of the raspberry canes and strawberry rows, it seemed possible that the site had been destroyed by cultivation. A test pit, designated Test Pit No. 1, was dug to determine the possible value of future excavation. Because it was dug before the site grid was laid out, it was not square to the grid; it was located relative to fixed points to permit its being plotted on a grid later.

When the cultivated layer had been removed, it was apparent that a considerable undisturbed midden remained below the plough line. This midden was trowelled, and profiles were recorded at various points, but floor plans were not maintained, other than the one immediately below the plough line. The deposit proved to be a tear-drop-shaped depression 12 feet long, 7 feet wide at the widest point, and approximately 15 inches deep; most of it was overlaid with a thin lens of white ash. The presence of a layer of black mould, an inch or less thick on much of the bottom and on the sides to a height of approximately seven inches, supports the possibility of the depression having been lined.

Before the garden was planted in the spring of 1951, two five-foot squares were dug and named Test Pit No. 2. Two more five-foot squares, named Test Pit No. 3, were dug in the autumn of that year. These four squares were not on the site grid but were located for subsequent plotting.

In 1952 it was arranged that an area, recorded as having been rich in surface finds, would be excluded from cultivation and, therefore, made available for excavation during the summer. This concession permitted work to commence on the largest area of the site to be excavated.

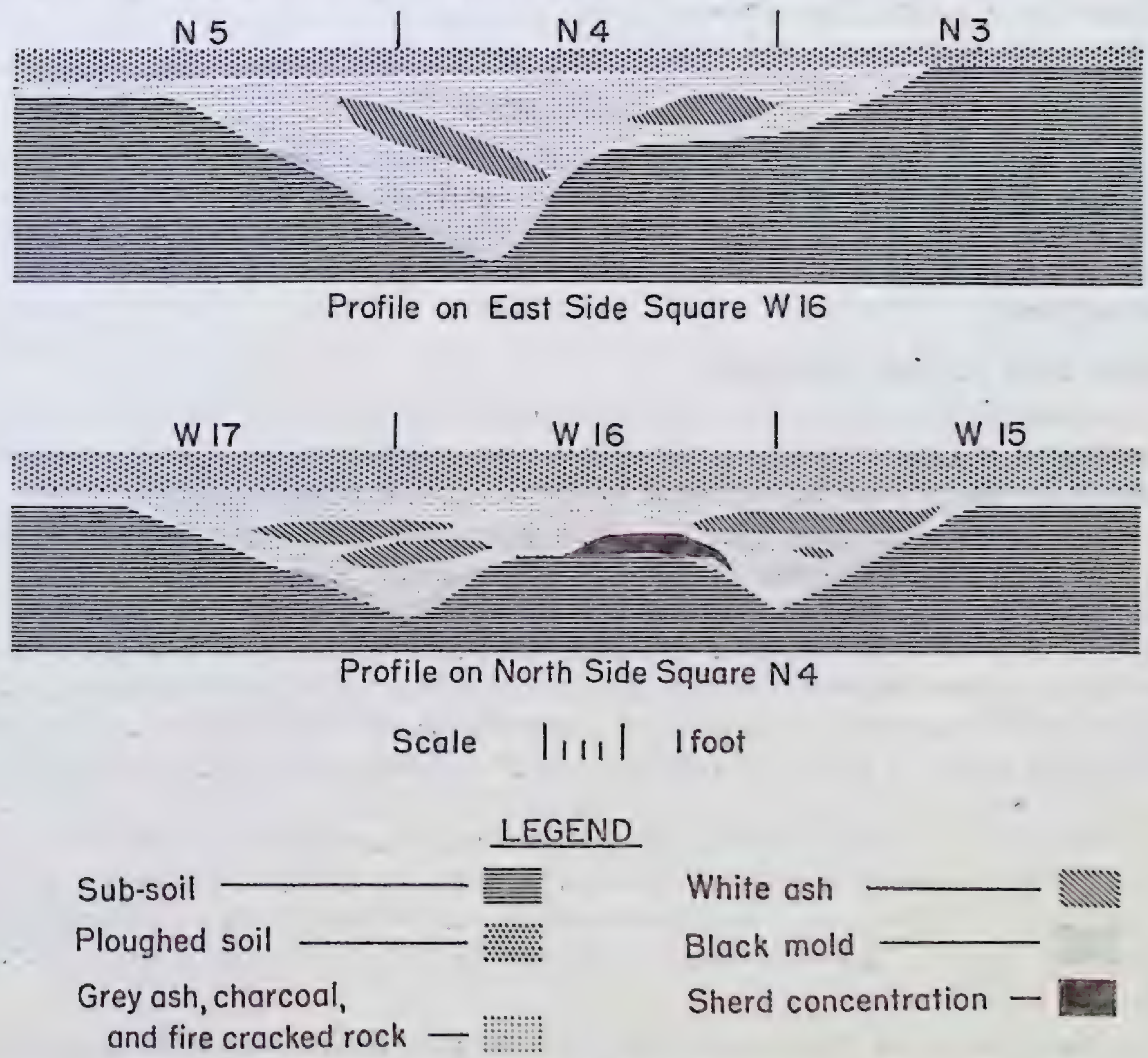
N 5
N 4
N 3
Profile on East Side Square W 16
W 17
W 16
W 15
Profile on North Side Square N 4
Scale
1 foot
LEGEND
Sub-soil
Ploughed soil
Grey ash, charcoal, and fire cracked rock
White ash
Black mold
Sherd concentration

FIGURE 2. Cross-section of the Midden excavated in 1952

A site grid of five-foot squares was laid out from a surveyed datum point with the axis of the grid on the magnetic cardinal points. This done, the location of Test Pits 1, 2, and 3, excavated in 1950 and 1951, were plotted on a schematic grid map of the site.

Excavation commenced in square N4 W16 and followed through squares N3 W16, N4 W17, N4 W15, N3 W15, N5 W16, N3 W14, and N5 W17, in that sequence. The location of this area and of those excavated in 1950 and 1951 is shown in Figure 1.

In all these excavations, artifacts were found at all levels to the sterile subsoil, including the ploughed layer. There was a general horizontal and vertical distribution of artifacts in the area with no apparent pattern other than a small concentration of potsherds found in square N4 W16 at a depth of 15 inches. There was no indication of cultural stratification. The midden varied from 2 to 3 inches deep in the north side of squares N5 W16 and N5 W17, to a maximum of 30 inches in the middle of square N4 W16. Generally speaking, the bottom of the midden was undulating, suggesting debris-filled, natural trough-shaped depressions, rather than steep-sided, man-made pits. The bottoms of two of the depressions were lined with an inch or so of black mould containing kernels of corn, pieces of corn cob, corn stalk, beans, acorns, hickory nuts, and birch-bark.

ARTIFACTS

This discussion of artifacts involves all those unearthed during the three-year period of excavation. Table 5 in Appendix sets out the sites on which artifacts similar to those of the Payne site were found. It is not intended to be definitive but rather to be indicative of the distribution of these items.

Bone and Antler Artifacts

General. Ninety-seven bone and antler artifacts were recovered. Their good state of preservation no doubt was due to the neutral to alkaline Athol Sandy Loam on which the site is located.

Awls. Ten complete and twenty-one fragmentary awls were found. All are made from animal bone, or splinters therefrom, which show the marrow cavity. Nine retain an articulation end, six of which have the joint ground or polished. Five from bones without an articulation end are ground or polished on the blunt end. As a group, these five are the whitest and most polished. Twelve may be pieces of the pointed end of a larger awl or may represent pieces of bone on which no work was done other than having been pointed. Seven are small fragments from which the point and possibly the blunt end have been broken. One awl is simply a rough bone splinter, one end of which has been ground to an abrupt point. All have been formed by grinding or scraping, and in some cases they have been polished. The largest complete awl is 154 mm long, the shortest 65 mm; the remainder vary from 87 mm to 118 mm.

Skewers. Four thin polished bones, about 10 cm long with elongated points, are considered to be too fragile for use as awls; hence they are considered to be skewers or possibly pins for clothing or for the hair. One of these items is made from the splanchnic bone of a raccoon, two are from bird bones with the articulation end ground round, and the fourth is from a bone splinter. The splanchnic bone and bone splinter have been scorched at the pointed end. This characteristic has been noted by Wintemberg (1936, p. 55; 1939, p. 31) and might be indicative of their having been used to hold material, possibly food, in a fire.

Beads. Sixteen complete bone beads and twenty-two fragments of beads were recovered. All are cylindrical in shape and are made from bird bones, except four fragments, which may have been made from the bones of small mammals. They vary in length from 42 mm to 6 mm, with the majority being 25 mm to 30 mm long. The surface finish varies from well polished on some to natural surfaces on others. Some have uneven, though polished ends; others are both smooth and even. Cutting marks resulting from manufacture and wear marks due to stringing are evident in some cases. One bead is decorated with a line cut around its circumference.

One piece of recovered bird bone lacked both of the articulating ends leaving a hollow blank from which beads could be cut. Cuts in three places indicate that this process was started but never completed. Three bird-bone joints cut from the bone shaft appear to represent discards of bead making.

Toggle-form ground phalanges. Eight ground deer phalanges of the toggle form were found. The largest specimen is 56 mm long, the shortest 38 mm long, and the remainder are from 45 to 50 mm long. Two have the projections of the proximal and distal joints ground flat on the bottom. These two bones probably represent partially completed items to be described. No phalanges that had been worked for use as cup-and-pin game pieces were recovered.

One phalange has been ground flat on the top and bottom to a wedge shape. As a result, there are two holes on the top and one at each end where the marrow cavity has been exposed. The bottom has a small hole through to the top at the distal end and a large hole to the marrow cavity at the proximal end. Its top is decorated with a transverse incised line near the distal end and two transverse bands ground between the two holes.

Four of the phalanges have been ground on the bottom to the extent that a small hole projects through to the marrow cavity at the distal end and a similar elongated hole extends from the proximal end to midway along the length. The top is ground and scraped, and in one case polished, through to the marrow cavity. Two of these specimens are decorated with transverse cuts across the top, bridging the hole.

One has been ground on the top and bottom into a wedge shape in such a way as to produce one hole on each side through to the marrow cavity, the distal end being the sharp end.

Projectile points. One crooked antler-tine point and two conical bone points were found. The antler-tine point is round in cross-section, 55 mm long and 11 mm in diameter at the bifurcated base, which is drilled or scraped to a hole 3 mm in diameter and 2 mm deep. Both conical bone points are ground on one side through to the hollow centre leaving only one side intact to form the point. One item is 47 mm long and roughly triangular in cross-section with a base 11 mm wide. The other is round in cross-section, 43 mm long and 7 mm in diameter.

Netting needles. One fragment of a bone netting needle, 47 mm long, 7 mm wide, and 2 mm thick, was found. It was made from a fragment which has been ground to a very flat plano-convex shape leaving a portion of marrow cavity. It is perforated along the longitudinal axis, and at this point it is broken. Such items are classified as a Huron trait by Ridley (1952*a*).

Flaker. A short, heavy piece of animal bone, 58 mm long, 15 mm wide at the widest point, and 6 mm thick, shows signs of having been pressure-flaked at one end. Although it is described as a flaker, there is no certainty it was used as such.

Dagger-like object. An antler-tine object, 142 mm long, oval in cross-section, approximately 15 mm thick at the thickest point, has been ground and scraped to a chisel-shaped tip. The chisel face, which is intact, is oblique to the longitudinal axis and is about 8 mm wide. Back 52 mm from the blunt end, both sides are ground to taper to a thickness of 9 mm. Eight millimetres from the blunt end a hole has been bored. A large spall is missing on one side from the blunt end to about the middle of the object. The manner in which the shaft is curved and shaped to fit easily into the clenched hand suggests its possible use as a dagger, but no certainty can be attached to the suggestion.

Very similar objects appear to have had widespread use, having been found on the Roebuck (Wintemberg, 1936, Plate XVII, 8 and 28), Downsview (Emerson, 1954, Figure 49, e), and Sidey-Mackay (Wintemberg, 1946, Plate XIX, C 24) sites.

Antler. A piece of antler beam approximately 75 mm long was found; both ends are cut square, and a tine has been removed. No use can be suggested for this item, and it may be but a discard from the antler industry.

Miscellaneous. A piece of polished bone, 38 mm long and shaped like a shovel, was found. The shaft portion, representing the handle of a shovel, is 25 mm long, 6 mm wide, and 4 mm thick, while the expanded portion, representing the scoop of a shovel, appears to have been octagonal, each side being 8 mm long. A somewhat similar item was found at the Roebuck site (Wintemberg, 1936, Plate XVII, 4). It may be a fragment of an awl or pin similar to that found on the Benson site (Emerson, 1954, Figure 95,a), but as both ends are broken, it is difficult to determine how it was used.

A piece of bone, 45 mm long, 20 mm wide, 6 mm thick, ground flat on one edge and one side, was found with both ends broken. A hole has been bored through, 15 mm from the flat edge. The second edge and side are missing, having rotted off. No use is suggested.

One bear tooth shows some signs of working, suggesting use as a pendant.

Stone Artifacts

General. Most of the very few stone artifacts recovered represent heavy rough tools.

Sinkers. Two flat limestone beach pebbles, notched for use as sinkers, occurred. One is 75 mm long, 60 mm wide, and 15 mm thick. The other is 90 mm long, 60 mm wide, and 15 mm thick. The smaller is notched on one side only; the larger, on both sides. These pebbles likely come from Lake Ontario in the Wellington–West Lake area where they are found on the beach in abundance. Their existence on the site, together with fish bones, supports the conclusion that fishing was a source of food.

Axes, adzes. Eight fragments of double-convex tools were found. One light flat piece of black-green hornblende schist, 120 mm long, 55 mm wide, and 13 mm thick, is ground to a sharp edge at one end in an angular manner indicating that the piece was held at various angles during grinding. Back 60 mm from the bit end, it is notched on both sides presumably for hafting, thereby suggesting its use as an axe.

One plano-convex adze was found in square N4 W16; its shape and size suggest its use as a hand tool. It is 100 mm long, 30 mm wide on the bit end, 18 mm wide on the poll, and 25 mm thick at its greatest thickness. The whole tool is heavily impregnated with grease.

Nine stone tool fragments, made from either black or black-green hornblende schist, cannot be classified by shape. Six of these fragments have straight, sharp cutting edges, and three have blunt or broken edges. None of these tools is greater in length than 120 mm; the average is approximately 90 mm.

Hammerstones and anvils. Ten stones fitting the description of hammerstones or anvils were found, three of which are fragmentary. Seven are of granite, varying from pink to black, two are of limestone, and one is of quartzite. All appear to be round, flat, waterworn pebbles; the largest, 85 mm in diameter and 55 mm thick; the smallest, 55 mm in diameter and 28 mm thick. The results of hammering are most apparent on the circumference, but on one flat surface of the largest pebble a depression 5 mm deep indicates its probable use as an anvil. One granite stone is partially discoloured red, as though it had been used to grind red ochre.

Mullers and mortars. Three fragments of green-black granite have flat, or slightly curved, polished surfaces suggesting that they are parts of mullers or mortars.

Projectile points. Three crude roughly triangular projectile points were found, two in the midden and one on the surface. All are made from mottled grey, black, and brown chert. Two unworked pieces of this type of chert were also found in the midden.

Knives. One flaked chert curved knife, 62 mm long, 23 mm wide, and 8 mm thick, was found on the surface. It also was made from mottled grey, black, and brown chert. Two-thirds of the knife is well worked, but the remainder, for the most part, is unworked.

Chisel. One small narrow piece of hornblende schist has been worked to a blade at one end; this suggests its use as a chisel. It is 54 mm long, 20 mm wide, and approximately 8 mm thick. The bit has been formed by grinding on all four sides to produce an abrupt plano-convex cutting edge.

Steatite. Two small fragments of black steatite occurred. One polished piece is 22 mm long, 7 mm wide, and 5 mm thick, concave on one side and convex on the other. The other small piece is unworked and roughly triangular in shape.

Slate. One piece of red slate, 48 mm long, 30 mm wide, and approximately 8 mm thick, is ground flat and polished on one edge, suggesting its use as a whetstone.

Polished pebbles. Eight small polished pebbles were found in the midden; none are worked—unless their polish is artificial. They are mentioned here because they resemble those found by Ridley on contact Huron sites (Ridley, 1952*a*, p. 201.)

Clay Artifacts

General. Potsherds form the bulk of the specimens of the earthenware artifacts recovered. Beads, discs, and pipes were also found.

Beads. Two earthenware beads were found. One is a brick-red truncated conical bead 9 mm long, 10 mm in diameter at the larger end, 8 mm at the smaller end, and with a hole 3 mm in diameter. The fact that the hole is symmetrically circular with no rough edges indicates that the clay was probably formed on a twig or reed which was later burned out. The other is brown and oval-shaped, approximately 20 mm in diameter and 15 mm thick. The rough irregular hole appears to have been punched while the clay was still soft.

Gaming discs. Three unperforated gaming discs made from potsherds were found. One, 37 mm long, 22 mm wide, and 5 mm thick, is nearly rectangular with rounded corners and the edges ground smooth. Another, a sherd 25 mm in diameter and 8 mm thick, is only partially ground along the edge where it was necessary to make it round. The third, 30 mm in diameter and 6 mm thick, has been broken to shape, leaving the rough edges.

Pipes.[1] Three complete earthenware pipes were recovered. One Plain Trumpet type is smooth, buff in colour, with a maximum bowl diameter of 43 mm, an over-all length on the stem axis of 60 mm, and an over-all height of 75 mm. The second is a very small, grey-brown, coarse Elongated Ring pipe with a bowl diameter of 19 mm, an over-all length on the stem axis of 31 mm, and an over-all height of 30 mm. The top of the bowl has an undecorated flange which overhangs the bowl by 3 to 4 mm. Possibly it is a toy. The third complete pipe is also an Elongated Ring type with two lightly incised lines around the bowl near the top. It is 51 mm in over-all length on the stem axis and 35 mm high, and the bowl is 20 mm in diameter.

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[1] Pipes are described by types established by Emerson, 1951.

Thirty-four pipe bowls and fragments of pipe bowls were recovered. An analysis of these is given in Table 1. Colours vary, but black and buff predominate. One Plain Trumpet bowl fragment is quite red as though it had been painted with red ochre or that substance had been included in the paste.

One bowl fragment, generally cylindrical in shape, is unique. The wet clay has been finger-pinched in an irregular manner to form an over-all rough surface with protuberances 5 to 6 mm high.

Sixty-six pipe stems or fragments of pipe stems were found, forty-seven of which are fragments lacking the mouth-piece. None of the 19 stems with the mouth-piece intact show any signs of being flared. They vary in colour from black and grey to brown. The majority (61) have a straight taper and are usually hard and polished. One is a large rectangular stem, 26 mm wide, 22 mm thick, with a 5-mm hole; another is almond-shaped. Three are irregularly shaped, unpolished, and are less dense than the others, thus giving the impression that they were loosely moulded in the hands before firing. Complete stems vary in length from 86 mm to 30 mm with 45 to 50 mm lengths being most common.

TABLE 1. *Pipe types*

Type	No.	Per Cent
Ring Trumpet	2	5.9
Plain Trumpet	18	52.9
Elongated Ring	8	23.5
Apple-Bowl Ring	1	2.9
Vasiform Plain	1	2.9
Decorated Collared(?)	1	2.9
Untyped	3	8.8
TOTAL	34	99.8

Pottery. No complete pots were found, but it has been possible to complete two reconstructions and several partial reconstructions, which give a fair indication of vessel shape and size. Vessels vary in lip diameter from approximately 10 cm to 30 cm and from 125 mm to 40 cm in height. None appear to have been made by the coil method but rather by the paddle-and-anvil technique with crushed stone or sand as tempering. There is evidence, in the manner in which fractures have occurred, that the body of some pots was formed separately from the collar and neck.

All are typical globular Iroquoian vessels with long necks predominating. A unique exception is one reconstructed Black Necked decorated pot which has a horizontal surface 85 mm wide under a single pointed castellation. There are no indications of cup- or bowl-shaped vessels. Thickness varies from 4 mm on a pot with an estimated 175 mm lip diameter, to 20 mm noted on some body sherds recovered. In most cases the thickness ranges between 8 mm and 15 mm. Colours on external surfaces are predominantly brick red, buff, brown, and light grey, although black and mottled sherds are represented. Generally speaking the ware is coarse and hard. Sherd cross-sections usually show a band of black between the interior and exterior surface colours. The surface finish is smooth but for a few sherds which have a "crazed" surface. Some body sherds show the marks of being malleated with a checkered paddle and thongs, and others show signs of wiping with grass.

Pottery rim sherds. The 350 rim sherds recovered were typed in accordance with MacNeish's taxonomy presented in his "Iroquois Pottery Types" (1952). An analysis of Payne site rim sherds is presented in Table 2, and a general comparison of these Payne site rim sherd types with some other sites in Ontario is given in Appendix, Table 6.

Interior pottery decoration. One hundred and eighty-five, or 52.7 per cent of the rim sherds are decorated on the inside. The decoration, with one exception, takes the form of a single line of marks just below the lip. The single exception is a sherd with a double line of marks. In a few cases the line of decorative marks is sufficiently high on the rim to cut the horizontal surface of the lip.

The decorations take the form of small triangles, ellipses, circles, rectangles, and U-shaped marks. There does not appear to be any pattern regarding their manner of application. The long axis of the mark varies from rim to rim, and practically all possible arrangements are represented. The marks themselves are made by punctate, incised, push-and-pull, and stamped techniques, varying from very shallow to 2 or 3 mm deep. Otstungo Incised, Lalonde High Collar, Onondaga Triangular, and Seed Incised decorated sherds do not have interior decorations.

Pottery shoulder decorations. Eighty shoulder sherds were recovered; most of them are rounded, but a few carinated shoulders are included. The only indications of more elaborate shoulders are two fragments of shoulders which could be portions of peaked shoulders from small pots similar to those found on pots from the Fallis (Ridley 1952*b*) and Sidey-Mackay (Wintemberg, 1946) sites.

The decorations, other than the first two mentioned in Table 3, extend onto the body, but because of the fragmentary condition of the sherds it is not possible to state with certainty whether the decoration extends over a greater portion of the body.

TABLE 2. *Analysis of rim sherds*

Decoration Type	Quantity	% Rim Sample
1. Lawson Incised	71	20.3
2. Huron Incised	51	14.6
3. Black Necked	48	13.6
4. Pound Necked	33	9.4
5. Lawson Opposed	29	8.4
6. Warminster Horizontal	19	5.4
7. Lanoraie Crossed	17	4.9
8. Ontario Horizontal	16	4.6
9. Durfee Underlined	13	3.7
10. Dutch Hollow Notched	12	3.4
11. Warminster Crossed	12	3.4
12. Sidey Crossed	8	2.3
13. Sidey Notched	5	1.4
14. Otstungo Incised	4	1.1
15. Roebuck Low Collar	3	.9
16. Thurston Horizontal	2	.6
17. Swarthout Dentate	2	.6
18. Otstungo Notched	2	.6
19. Lalonde High Collar	1	.3
20. Syracuse Incised	1	.3
21. Onondaga Triangular	1	.3
TOTAL	350	

TABLE 3. *Shoulder decorations*

Decoration	No.
One row of punctates	42
Two rows of punctates	2
Chevrons	4
Horizontal lines	1
Horizontal lines or chevrons over dots	14
Horizontal lines or chevrons below dots	5
Plain	12
TOTAL	80

OTHER REMAINS

Two pieces of unworked birch-bark were recovered from the black mould layer of the pit in square N4 W16. One piece appears to be naturally rolled into a tube 19 mm long and 7 mm in diameter; the second is a thick black piece curled at one end, 58 mm long, 52 mm wide, and 6 mm thick.

FOOD REMAINS

Judging from the food remains recovered, the inhabitants procured their foodstuffs by hunting, fishing, agriculture, and gathering, in that order of importance.

Both fragmented and intact bones were recovered; the following have been identified:

Table 4. *Faunal remains*

	No.
Deer (*Odocoileus virginiensis*)	88
Fish	48
Shells	40
Turtle (*Chelonia*)	25
Beaver (*Castor canadensis*)	21
Muskrat (*Ondatra zibethicus*)	13
Snails	10
Raccoon (*Procyon lotor*)	6
Small dog (*Canis familiaris*)	1
Unidentified	367
Total	619

Catfish spines and other fishbones and scales support the likelihood of a fishing industry. The number of unworked clam shells found indicates the use of clams as food also. Agriculture is represented by 135 carbonized corn kernels, 13 corn cob fragments, five corn stalk fragments, and 36 beans recovered. Food gathering is indicated by the 29 carbonized acorns and eight bitter hickory nuts found.

HABITATIONS AND DEFENCE

A number of post-moulds were uncovered, but excavations were not sufficiently extensive to indicate house shapes. The spacing and location of the post-moulds uncovered do not suggest that they were the remains of a palisade.

It is unlikely that defence was a major factor in the lives of the inhabitants, otherwise they would likely have chosen a more easily defended site on one of the nearby hilltops.[1] The paucity of projectile points recovered by excavation and surface collecting supports this hypothesis.

COMMERCE

No materials, worked or unworked, with the exception of the steatite and chert, which are not known to occur locally, were recovered which cannot be found within a few miles of the site.

BURIALS

No burials were located nor were any fragments of human bone identified.

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[1] Kidd, 1948, p. 73: Prehistoric Huron "sites are frequently in less defensible locations than later ones, as for instance in an open plain, but yet a good distance from rivers."

CONCLUSIONS

The Payne site was occupied by a prehistoric Iroquoian people, probably early Huron, who derived their livelihood from agriculture, hunting, fishing, and food gathering. It is not likely that the defence of the village was a major consideration; otherwise the village would have been located on one of the more easily defended features available in the area. This conclusion is supported by the paucity of projectile points. Extensive use was made of bone in making ornaments and, to a lesser extent, in making tools and weapons. Stone tools were in general use, as represented by the number of axes, adzes, and hammerstones found. Recreation, possibly gambling, is suggested by the existence of ground deer phalanges and pottery discs. Judging from the number of pipe fragments recovered, smoking appears to have been a common habit.

DISCUSSION

The Payne site is located a considerable distance east of historic Huronia and of most of the early Huron sites excavated to date. However, judging from the pottery found since late in the nineteenth century in the areas of Baptiste Lake, Perth, Herschel Township, Havelock, Wellers Bay, and Victoria County, and illustrated or described in the Ontario Archaeological Reports (1891, 1896–7, 1899, 1901, 1912, 1917, 1919, 1921–2), there has been for some time a basis for accepting, or suspecting, the occupation of this general area by the early Huron.

In addition to the Payne site, the existence of at least four other similar sites in Prince Edward County and a large site to the north of Hastings County supports the likelihood that the early Huron population in this area was of considerable size. Although all these sites appear to be quite similar, it remains for intensive investigation to determine whether they can be classed as a focus and to define their sequence of occupation.

Consideration of the site information, coupled with a general survey of the area over a period of two years, led the author to speculate in 1950 on the possibility of a migration of early Huron from the general area of the east end of Lake Ontario to historic Huronia on the general axis of the Trent Waterway. Subsequent investigations by MacNeish (1952), Emerson (1954 and 1960), and the author tend to support such a possibility.

The Trent Group early Huron[1] in Hastings and Prince Edward counties and the Payne site in particular tend to show the influence of the eastern group of the tribal Iroquois as evidenced by the existence of Mohawk, Onondaga, and Oneida pottery types on these sites, and the paucity, or absence, of Cayuga, Seneca, and Erie pottery types. This relationship is in keeping with the proximity of the Mohawk, Onondaga, and Oneida tribal areas south of Lake Ontario. Nevertheless the Trent Group in Prince Edward County, like the Humber Group to the west, appears to contain significant influence from southwestern Ontario, as is evidenced by the presence of considerable percentages of Neutral pottery types found on the Payne site. This influence on Trent Group sites has also been noted by Emerson (1960).

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[1] For ease of discussion in this paper, the early Huron population located at the eastern end of Lake Ontario on the general axis of the Trent Waterway has been designated the "Trent Group." The early Huron located at the western end of Lake Ontario on the general axis of the Humber River has been designated the "Humber Group."

The choice of locations for village sites by the two groups is a significant point of difference. The Trent Group in Prince Edward County chose relatively indefensible knolls and very gradual slopes for their villages, rather than the brows of more readily defensible hilltops which frequently were available nearby. On the other hand, the Humber Group usually chose high promontories for their habitations. Undoubtedly this difference reflects their different outlook regarding defence. The large number of projectile points found on Humber Group sites, as opposed to the few found on Trent Group sites, also illustrates this difference in outlook. This discrepancy concerning projectile points can hardly be attributed to the permanency of the stone points found on Humber Group sites vis-à-vis the less permanent bone points favoured by the Trent Group, because of the abundance of other bone artifacts located on Trent Group sites.

On the basis of this appreciation regarding defence, it is postulated that the day-to-day existence of the Humber Group was greatly influenced by their need for defence. By comparison, the Trent Group in Prince Edward County appears to have been on sufficiently good terms with its neighbours to enable them to avoid defensive preparations to the extent found necessary by the Humber Group.

In attempting to arrive at an opinion as to who these neighbours may have been, an extensive survey was made of the Ontario counties to the east along the St. Lawrence River. To date, these investigations have failed to locate a site with a ceramic complex approximating the Payne site or, for that matter, any of the Trent Group sites in Prince Edward or Hastings counties. Without exception, the Iroquois sites located in Glengarry, Stormont, Dundas, and Grenville counties are related to the Roebuck site in varying degrees. Parenthetically, this supports Emerson's astute claim for the existence of a Roebuck Focus (Emerson, 1954). As might be expected, reconnaissances of the Frontenac Axis of the Precambrian Shield in Leeds and Frontenac counties have failed to disclose a single Iroquois village site. Iroquois pottery has, however, been found in the area west of Perth and on the shores of Rock Lake north of Kingston, but no village site has been located that can be associated with these isolated finds. A cursory survey of Lennox and Addington Counties failed to locate an Iroquois site; however, more diligent efforts may locate a site there. On the basis of this experience it is concluded that

(*a*) The eastern limit of the Trent Group was likely the western boundary of the Frontenac Axis, and

(*b*) The eastern neighbours of the Trent Group were the Mohawk, Onondaga, and Oneida of northern, New York State and the Iroquois of the Roebuck Focus, or their antecedents.

Insufficient is known of sites in the area between the Trent Waterway and the Humber River to discuss the relationship between Iroquois sites in that area and those of the Trent Group in Prince Edward County.

Although certain traits of the Roebuck Focus appear on the Payne site, the question as to whether these sites were contemporaneous or whether the Roebuck Focus existed earlier or later must be considered before it can be asserted that the former influenced the latter.

The case in favour of believing that the Roebuck site, and likely the Roebuck Focus, existed after the Payne site occupation appears to rule out the alternative for the following reasons:

(*a*) The pottery from sites of the Roebuck Focus,[1] including the Roebuck site, is practically identical to that from Hochelaga. On this basis there can be little doubt that the Roebuck site and Hochelaga existed within a few years of each other or were possibly even contemporaneous. In fact, Hochelaga can be construed as a component of the Roebuck Focus. Recalling that Hochelaga is a contact site, having been visited by Cartier in 1535, and that Wintemberg considered the Roebuck site to be late prehistoric (Wintemberg, 1936), it is concluded that the Roebuck site is late prehistoric. The other sites of the Roebuck Focus likely belong in the same time span.

(*b*) An analysis of the Roebuck site pottery indicates that 1.8 per cent of the sherds were Neutral types and 4.1 per cent Huron types (MacNeish, 1952). This is considerably less than the percentages of these same pottery types found on the Payne site. This relationship suggests but little influence from southwestern Ontario on the Roebuck site. It also provides little basis for considering the Roebuck site, or the Roebuck Focus, to be significantly involved in the earlier Middleport to historic Huron and Neutral evolutionary sequence. On the other hand, the Payne site, judging from the pottery analysis, appears to be deeply involved in this sequence, which led to late prehistoric Huron and Neutral sites, sites which were likely coeval with Roebuck.

(*c*) The existence of early Onondaga-Oneida sherds on the Payne site, Lanoraie Crossed 5 per cent, and Swarthout Dentate 1 per cent, suggests an earlier date for Payne than for Roebuck, which produced only 1 per cent Swarthout Dentate but no Lanoraie Crossed at all (MacNeish, 1952).

Consideration of these three factors led to the conclusion that the Payne site existed before the Roebuck site and likely prior to other sites of the Roebuck Focus.

If, then, the Roebuck site, and likely the Focus, existed subsequent to the Payne site, the Roebuck traits found on the Payne site must have originated elsewhere than in the Roebuck Focus, although it is likely that these traits reached their apex on Roebuck Focus sites. Regardless of its location, this centre did influence the Trent Group, and the Payne site in particular. This hypothesis does not overlook the possibility, indeed the likelihood, that later Trent Group and Humber Group sites, such as the early contact Benson and McKenzie sites, reflect the influence of the Roebuck Focus. Neither does it exclude the possibility that prehistoric sites, e.g., the Waupoose site (MacNeish, 1952), were also influenced by the earlier stages of the Roebuck Focus or even earlier by the original centre.

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[1] Ten Iroquois sites have been investigated by the author and assessed as being components of the Roebuck Focus.

Having attempted to delineate the near side of Payne site antiquity, it remains to contain it on the far side. This is a difficult task and of

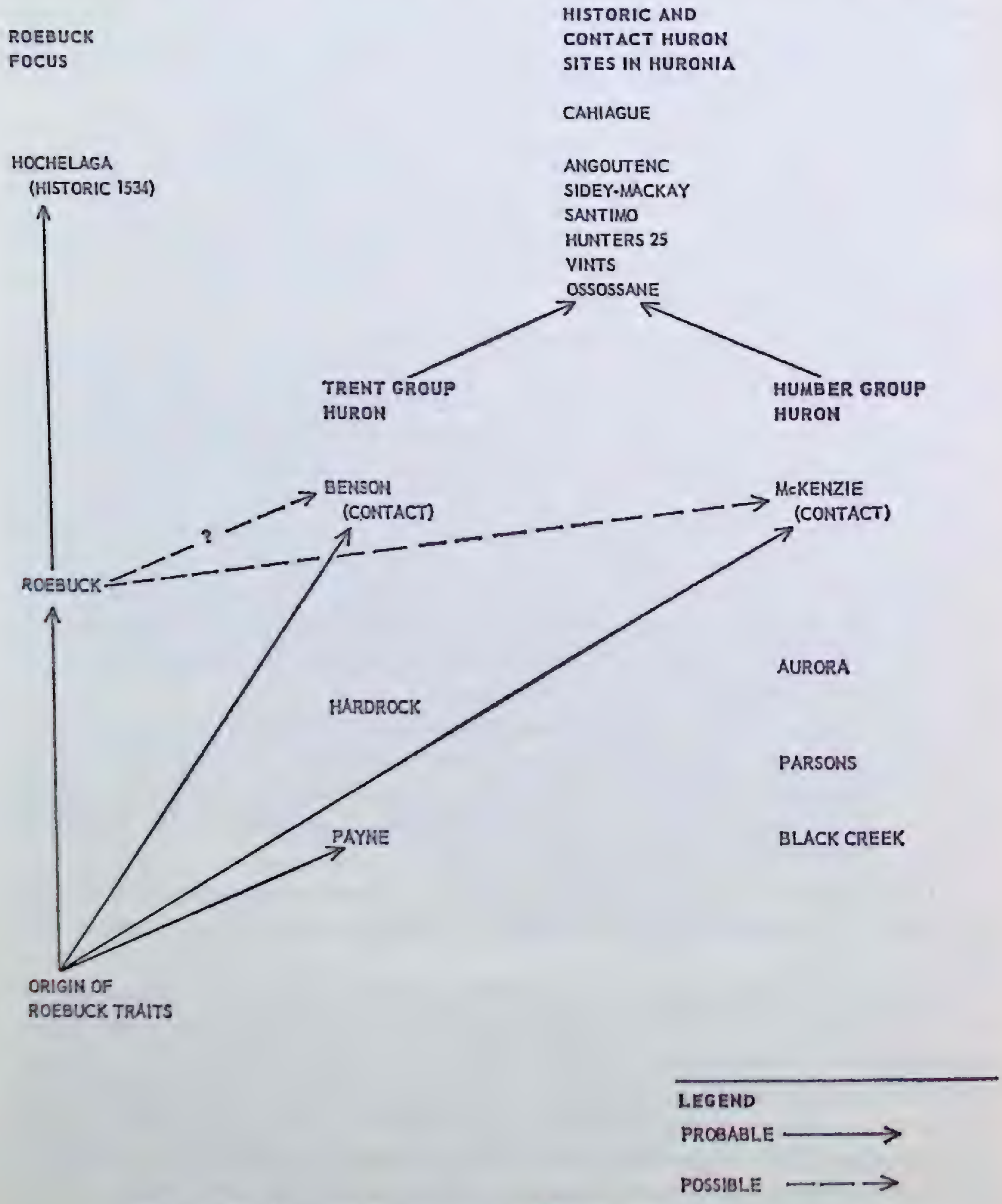

FIGURE 3. A speculative sequence of Ontario Iroquois components

necessity will have to be left in terms of comparison with the Humber Group sites, on which information has been published. The "Coefficients of Similarity" set out in Appendix, Table 8, indicate that the Payne site is closely related to the Parsons and Black Creek sites. The lack of detailed information on more sites of this general time makes it appear that the Payne site is closely akin to those sites, practically to the exclusion of others. Such a conclusion is not proposed, but lacking information on kindred sites as a basis for further comparison, it is not possible to say more than that it is likely that the Payne site probably existed in the Parsons/Black Creek time span. This conclusion is not such as to make the existence of typical Mohawk, Onondaga, and Oneida potsherds on the Payne site incongruous.

Placing the Payne site in a sequence of Ontario Iroquois sites involves risky and speculative assumptions. As has already been stated, little detail is known of the Trent Group because few sites have been systematically excavated and much remains to be done before the relationship between the Trent and Humber Groups is understood. However, in the interests of recording the author's views for future use, as either a positive or negative point of departure, the following sequence (Figure 3), including the Payne site, is suggested (MacNeish, 1952; Emerson, 1954 and 1956).

RÉSUMÉ

Entre 1950 et 1952, l'auteur de la présente communication a exécuté des fouilles à un village iroquois, situé près de Picton, comté de Prince Edward (Ontario). L'auteur décrit d'abord l'emplacement du gisement et les fouilles qui y ont été exécutées. Suit une description détaillée des objets façonnés mis à jour, d'après divers types, description dont une grande partie est consacrée à la poterie classée d'après les types proposés par MacNeish (1952). Enfin, l'auteur décrit et identifie les ossements découverts. Un chapitre traite des environs du gisement avec mention spéciale de leurs aspects défensifs.

En guise de conclusion, un sommaire des constatations révèle que les habitants étaient probablement des Hurons primitifs, qui subvenaient à leurs besoins en se livrant à l'agriculture, à la chasse, à la pêche et à la cueillette de produits alimentaires. Quant au choix du lieu, son aspect défensif ne semble pas avoir été un facteur important. Ses habitants préféraient les outils en os plutôt qu'en pierre, mais l'auteur a aussi trouvé des haches en pierre et des percuteurs. La présence de phalanges de chevreuil, de pipes et de disques en poterie et en pierre, semble indiquer que ces objets servaient à des fins de récréation. On semble croire que les ancêtres des Hurons, désignés sous le nom Groupe de Hurons de Trent, se sont déplacés de l'extrémité est du lac Ontario pour se rendre au pays historique des Hurons, en suivant l'axe du bassin de la rivière Trent. Le lieu se compare aux gisements de la rivière Humber, du point de vue défensif. L'auteur a cherché à déterminer les relations culturelles du gisement de Payne, afin de préciser certaines sources d'influence culturelle. Il en a conclu que les Iroquois du foyer culturel de Roebuck vinrent après

ceux du gisement de Payne et, par conséquent, ne purent avoir aucune influence sur leur culture. Les particularités du foyer culturel de Roebuck, notées au gisement, sont attribuées à une source antérieure qui n'a pas encore été identifiée. Un tableau (figure 3) présente une suite hypothétique de certains sites des tribus iroquoises de l'Ontario, tels le Groupe de Hurons de Trent, le Groupe de Hurons de Humber et le foyer culturel de Roebuck, et il indique leurs liens probables de parenté.

Les illustrations comprennent une photographie aérienne du gisement et des profils des fouilles. Les tableaux montrent la relation qui existe entre le gisement de Payne et d'autres gisements iroquois de l'Ontario en fonction des objets façonnés, particulièrement les types de pipes et de poteries. M. J. N. Emerson a déjà exécuté des fouilles au même gisement, en 1958. Les rapports préliminaires de ses travaux ont déjà été publiés sous le titre *The MacDonald Site*. Par la suite, Emerson et Pendergast ont consenti à accepter la nomenclature utilisée pour le gisement de Payne. Le compte rendu de M. Emerson, qui est distinct du présent rapport, paraîtra plus tard.

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Appendix

TABLE 5
Some Sites in Ontario on Which Artifacts Have Been Found Similar to Those Found on the Payne Site

TRAIT	SITES																	
	PA	LA	CL	PO	UR	MI	DO	BC	MK	AU	BE	SM	CA	RO	HA	WE	FL	FA
Bone and Antler Artifacts:																		
Awls	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Splanchnic awl	X	X	—	—	—	X	—	—	X	—	—	—	—	—	—	—	—	—
Pins	X	—	—	X	X	X	—	—	—	—	—	—	—	—	—	—	—	—
Tubular beads	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ground phalange toggles	X	—	—	—	—	—	—	X	X	X	X	X	—	X	X	X	X	—
Antler points	X	X	—	X	X	—	—	—	—	—	—	—	—	X	—	X	—	—
Conical bone points	X	—	—	—	—	—	X	X	—	—	X	X	—	X	X	—	X	—
Dagger	X	—	—	—	—	—	X	—	—	—	—	X	—	X	—	—	—	—
Worked bear canine	X	—	—	—	—	X	—	X	X	X	X	—	—	X	X	—	—	—
Netting needles	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—	X
Stone Artifacts:																		
Sinkers	X	X	—	—	—	X	—	—	—	—	—	X	—	—	—	—	—	—
Hammerstones	X	X	—	—	X	—	—	—	X	—	—	X	—	X	—	—	X	—
Tools reused as hammers	X	X	—	—	X	—	—	—	—	—	—	—	—	X	—	—	—	—
Mullers	X	X	—	—	—	—	—	X	X	—	—	X	—	X	—	—	—	—
Adze	X	X	—	—	X	—	—	X	X	—	X	X	—	X	X	X	—	X
Axe	X	X	—	—	X	—	X	X	X	X	X	X	—	X	X	—	—	—
Isosceles triangular point	X	X	X	—	X	X	X	X	X	X	—	X	X	—	—	—	—	—
Elongated triangular point	X	X	X	—	—	X	X	X	—	X	—	—	—	X	—	—	—	—
Knife	X	X	X	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—
Clay Artifacts:																		
Gaming discs unperforated	X	—	—	—	X	X	—	—	—	X	X	X	X	X	—	—	X	X
Beads	X	—	X	—	—	X	—	—	—	—	—	X	—	X	—	—	—	—
Pipe types	(*see* APPENDIX, Table 6)																	
Pottery rim types	(*see* APPENDIX, Table 7)																	
Pottery castellations	(*see* APPENDIX, Table 9)																	

LEGEND: PA – Payne
LA – Lawson
CL – Clearville
PO – Pound
UR – Uren
MI – Middleport
DO – Downsview
BC – Black Creek
MK – McKenzie
AU – Aurora
BE – Benson
SM – Sidey-Mackay
CA – Cahiague
RO – Roebuck
HA – Hardrock
WE – Webb
FL – Flanagan
FA – Fallis

Table 6

Payne Site Pipe Types Compared With Those From Some Other Sites in Ontario[1]

PIPE TYPES	SITES								
	Payne	Black Creek	McKenzie	Sidey-Mackay	Aurora	Benson	Downsview	Hardrock	Roebuck
Decorated Barrel	—	—	—	X	—	—	—	—	—
Vasiform Plain	X	X	—	—	X	—	X	—	X
Elongated Ring	X	X	—	—	—	—	X	—	—
Apple-bowl Ring	X	X	X	—	X	X	X	—	—
Vasiform Decorated	—	X	—	—	—	—	—	—	—
Iroquois Ring	—	X	X	X	X	X	X	—	X
Plain Trumpet	X	X	X	X	X	X	X	X	X
Ring Trumpet	X	—	—	—	—	—	X	X	X
Decorated Trumpet	—	—	—	—	—	—	—	X	X
Collared Ring	—	—	—	X	—	X	X	—	X
Mortice	—	—	X	X	—	X	—	—	—
Owl and Bear Effigy	—	—	X	—	—	X	—	—	X
Bird and Wolf Effigy	—	—	X	—	—	X	—	X	—
Bulbous Ring	—	—	—	X	—	—	—	—	—
Snake Effigy	—	—	—	—	—	X	—	—	X
Decorated Collared	X	—	—	X	—	—	—	—	—
Flaring Ring	—	—	—	X	—	—	—	—	—
Human Effigy	—	X	—	—	X	X	X	X	X
Cornet	—	—	X	X	X	X	—	—	—

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[1] Pipe classification and their existence on sites, other than Payne, are taken from Emerson, 1954.

Table 7

Payne Site Pottery Type Percentages Compared With Those of Some Other Iroquois Sites in Ontario[1]

SITE	POTTERY TYPES																																
	Lawson Incised	Huron Incised	Black Necked	Pound Necked	Lawson Opposed	Warminster Horizontal	Lanoraie Crossed	Ontario Horizontal	Durfee Underlined[2]	Dutch Hollow Notched	Warminster Crossed	Sidey Crossed	Sidey Notched	Thurston Horizontal	Otstungo Incised	Roebuck Low Collar	Swarthout Dentate	Otstungo Notched	Lalonde High Collar	Syracuse Incised	Onondaga Triangular	Niagara Collared	Ripley Plain	Pound Blank	Seed Incised	Cayuga Horizontal	Seed Corded	Cayadutta Incised	Genoa Frilled	Middleport Oblique	Richmond Mills Incised	Seneca Barbed	Baum Corded
Payne......	20	15	14	9	8	5	5	5	4	3	3	2	1	1	1	1	1	1	.3	.3	.3	—	—	—	—	—	—	—	—	—	—	—	—
Black Creek....	11	23	30	3	3	5	—	12	1	—	—	—	—	—	—	1	—	—	—	—	2	2	—	—	1	—	—	—	—	3	2	—	—
McKenzie..	11	35	2	—	2	1	—	4	1	—	—	1	10	—	—	—	—	—	—	—	4	—	—	—	7	5	2	3	—	—	1	—	—
Seed.......	6	30	4	—	3	1	—	1	—	2	1	1	5	—	—	1	—	—	—	1	—	—	1	—	26	1	10	1	—	—	1	—	2
Sidey-Mackay.	5	28	5	—	4	—	—	1	2	—	8	3	22	—	—	1	—	—	—	1	1	—	—	—	8	—	—	4	—	—	3	—	—
Warminster	1	44	2	—	—	13	—	1	—	—	22	—	13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	1	—
Orr Lake..	2	45	3	—	2	—	—	1	1	—	10	1	11	—	—	—	—	—	—	—	2	—	—	—	1	—	—	—	20	—	—	1	—
Parsons....	31	16	8	11	15	—	—	—	—	1	—	—	—	—	—	—	—	—	3	—	10	—	—	1	—	—	—	—	—	—	—	—	—
Lawson....	52	1	—	11	11	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	1	18	2	—	1	—	—	—	—	—	—	—	—

[1] Information on sites, other than Payne, is taken from Emerson, 1954 and 1956.
[2] Classified "Onondaga Underlined" by Emerson, 1956.

TABLE 8

Coefficients of Similarity for Payne Site and Some Other Iroquois Sites in Ontario[1]

SITES	Payne	Black Creek	McKenzie	Seed	Sidey-Mackay	Warminster	Orr Lake	Parsons	Lawson
Payne	—	118	79	75	83	57	59	128	87
Black Creek	118	—	99	93	92	66	69	91	56
McKenzie	79	99	—	123	147	114	118	74	35
Seed	75	93	123	—	124	84	90	63	29
Sidey-Mackay	83	92	147	124	—	90	118	67	32
Warminster	57	66	114	84	90	—	142	39	6
Orr Lake	59	69	118	90	118	142	—	54	12
Parsons	128	91	74	63	67	39	54	—	125
Lawson	87	56	35	29	32	6	12	125	—

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[1] Information on sites other than Payne is taken from Emerson, 1954 and 1956.

TABLE 9

Payne Site Castellations Compared With Some Other Sites in Ontario[1]

	SITES								
	Payne	Black Creek	McKenzie	Sidey-Mackay	Aurora	Benson	Downsview	Hardrock	Roebuck
Turret	—	—	—	X	X	—	—	—	—
Grooved	—	—	—	X	X	X	—	—	—
Incipient Turret	—	—	X	—	X	X	—	—	—
Notched	—	—	—	X	X	X	—	—	X
Circular Punctate	—	—	X	X	—	X	—	—	X
Undulating Multiple	X	—	—	—	—	X	—	—	X
Broad Multiple	—	—	X	X	X	X	—	—	X
Developed Multiple	—	—	X	—	X	—	—	X	X
Scalloped Multiple	X	—	—	—	—	—	—	X	X
Complex Throat	X	X	X	X	—	X	X	X	X
Rolled Rim	—	X	X	X	X	—	X	—	—
High Collar Pointed	X	—	—	—	—	—	X	—	—
High Collar Nubbin	X	X	—	—	—	—	X	—	—
Classic Early	X	X	X	—	X	—	X	—	X

[1] Castellation classification and their existence on sites, other than Payne, are taken from Emerson, 1954 and 1956.

THE PEOPLE OF FAIRTY:

An Osteological Analysis of an Iroquois Ossuary

By J. E. Anderson*

I. INTRODUCTION

The Fairty ossuary was located near the outskirts of Toronto, Ontario, on Lot 1, Concession 8, Markham Township. Nearby are three Iroquois sites: Milroy, Reesor, and Robb. It is thought that the Fairty people preceded Black Creek in the Ontario Iroquois sequence.

Mr. J. V. Wright of the National Museum of Canada has kindly offered the following statement on the cultural and chronological position of the Fairty ossuary, "Insufficient artifactual material occurred in the Fairty ossuary to place it effectively in a specific time period (Donaldson, 1962: 19[1]). The ossuary, however, was located a short distance to the east of the Robb site and almost certainly represents the burial location for the dead of that village site. Excavation of the Robb site by the Ontario Archaeological Society and analysis of the materials (Wright, 1960[2]; Donaldson, 1962) permit the temporal and cultural placement of the Fairty ossuary within the Ontario Iroquois Tradition. The Robb component belongs to the Middle Ontario Iroquois Stage of the Ontario Iroquois Tradition and is regarded as an early representative of the Middleport period within that stage. Such a placement would give the Robb site (and, indirectly, the Fairty ossuary) an approximate date of A.D. 1400. In the writer's present interpretation of the Ontario Iroquois Tradition the Robb-Fairty complex belongs to the later part of a homogeneous archaeological complex covering most of southern Ontario and a portion of southwestern New York State which resulted from the fusion of two earlier complexes, Glen Meyer in southwestern Ontario and Pickering in southeastern Ontario. It was from this homogeneous base that the Huron, Petun, Neutral, and Erie tribal groups diverged. Evidence of divergence was already present at the Robb site in the form of early Huron-Petun pottery types."

Ossuary burial, a secondary common interment for all the dead of a village, occurred approximately every ten years among the Iroquois. At this time, a "Feast of the Dead" was held and the primary burials were exhumed and transferred to a large common pit. At least 216 ossuary sites are known in the Province of Ontario. Many have been excavated and many looted. Five published reports on excavated ossuaries examine different aspects of a complicated subject:

Knowles (1937) reported craniometric values for a large number of crania from different ossuaries that had been excavated over the previous fifty years. The data were used for comparison with his material from the Roebuck site.

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[1] Donaldson, William S. (1962). "Archaeological Research in the Rouge." Ontario Archaeology, Pub. No. 6, Ser. A, No. 5. Toronto.

[2] Wright, J. V. (1960). "The Middleport Horizon." Anthropologica, N.S. Vol. 2, No. 1. Ottawa.

*Dept. of Anatomy, University of Toronto.

KIDD (1953) has presented a comprehensive study on the excavation and historical identification of the Ossossané ossuary. His description of the "Feast of the Dead" is excellent.

HARRIS (1949) examined some of the material from the ossuary at Cahiague and described evidences of pathology in that population.

CHURCHER and KENYON (1960) have done a detailed study on Iroquois demography based on the skeletons from the Tabor Hill ossuaries.

RIDLEY (1961) in his outline of Neutral archaeology gives interesting descriptions of the architecture of ossuaries.

Thus we have a background of information from the standpoint of history, archaeology, demography, craniometry, and pathology. The present report emphasizes morphology and variation, particularly of the infracranial skeleton, which is often neglected. A conscientious attempt has been made to study every bone and fragment recovered in order that the results may be representative of the population described. The aim is to provide a baseline for future comparative work on Ontario Iroquois osteology.

The physical anthropologist who deals with Huron-Iroquois material feels cheated when he surveys the burial practices of other areas where large numbers of individual burials are available, where well-preserved crania may be associated with their infracranial skeleton, and where the bones, if not intact, are readily reconstructible because of their proximity to each other.

Not so in ossuary burials, where large pits yield the common graves of hundreds of individuals whose parts are incomplete and are totally dissociated and severely damaged. Demographic studies which depend on accurate determination of age and sex of individuals become not merely a challenge, but a complex jigsaw puzzle with many of the parts withheld from the player. In the absence of a large series of measurable crania and with no hope of reconstructing individuals, different goals are sought in the study of ossuary material. Here one deals not with populations of people, but with populations of humeri, femora, temporal bones, and so on. The very absence of measurable material, which might tempt to routine analysis, forces one to reconstruct more carefully, look at fragments with more respect, and do the utmost to wrest from the material every bit of information possible. The result is a population study of morphological variation and pathology which one might have been tempted to ignore had the material presented itself as individual burials.

The Fairty ossuary produced approximately 36,000 bones and fragments worthy of study. These were cleaned, treated, labelled, and catalogued. Preliminary sorting assigned fragments to regions of the body: skull, vertebrae, upper limb, and lower limb. These were then sorted according to individual bones, and the resulting heaps were further subdivided by identification as juvenile and mature, left and right sides, proximal and distal fragments. From these groups, systematic matching facilitated the discovery of many fitting fragments which were then reconstructed.

Study of the prepared material included measurement where possible, recording of morphological variation and pathology, photography and radiography where indicated. The results of analysis of this information constitute the subject matter of ensuing sections. The data presented give a detailed view of the osteology of an Iroquoian population: the people of Fairty.

ACKNOWLEDGMENTS

I have lived with the people of Fairty site for five years. Their skeletons have gained form and meaning in my laboratory, and through them I have met many workers who have come to see and remained to help in the many tedious stages that were necessary to bring this report to completion. It is a pleasure to acknowledge their assistance.

My first debt is to Dr. J. Norman Emerson and the Ontario Archaeological Society who excavated the site and laboured long hours in the preliminary stages of preparation of the material. Dr. Emerson's interest in this site led directly to the development of a programme in physical anthropology in the University of Toronto and to our valued personal friendship.

Many students have assisted in the programme. In particular, Mr. Charles Merbs, Mrs. Nancy Cameron, and Mr. Richard Austin contributed greatly to the preparation of data for analysis. Their interest and great care suggest a productive future for them in physical anthropology. I am grateful to Dr. Kenneth McCuaig, University of Toronto, for his assistance with the analysis of the dentition.

Dr. J. W. A. Duckworth, Professor of Anatomy, has provided facilities for the analysis of this large volume of material in an already crowded department. Financial assistance and encouragement have been provided by the National Museum of Canada through the interest of Dr. L. S. Russell, the acting director of the Human History Branch; Mr. William E. Taylor, whose archaeological enthusiasm has fortunately included the skeletons excavated; and Dr. Lawrence Oschinsky, who may see his interest in morphology reflected in this report.

I have been most fortunate in having the services of Mr. John Crean who photographed the specimens and Mr. Tom Munro who prepared the figures. Miss Joan Waterfield has patiently suffered the ordeal of manuscript preparation. Her assistance is greatly appreciated.

II. THE FAIRTY POPULATION

The quantitative description of a population based on ossuary material is of doubtful validity because of the large number of inconstant factors. Uncertainty exists at three levels:

1. *The relationship of the ossuary to the population from which it is derived.* Is it the *only* burial area? Was any type of selection used in burial practices? How long a period of occupation does it represent?

2. *Completeness of the sample.* How completely were the primary burials exhumed prior to transfer to the ossuary? Was there disturbance of the ossuary after burial? What errors might result from selective damage of parts of the skeleton?
3. *Association of individuals.* Age and sex determinations are quite unreliable when based on single bones or fragments, and it is impossible to associate the bones of each individual with each other.

Bearing these limitations in mind, the skeletal population of the Fairty site has been analysed to determine the number of individuals, their age, sex, and stature.

Comparative data are available for another Ontario Iroquois ossuary population in the report of Churcher and Kenyon (1960) on the Tabor Hill site.

Population number

Table 1 gives an inventory of the numbers of major bones identified from this site. There is a wide range in the minimum number of individuals represented as calculated from the data. The discrepancy results from differences in size and strength of the various bones which would influence

TABLE 1. *Partial inventory of material*

Bone	Number of Items Catalogued	Minimum Number of Individuals		
		Mature	Immature	Total
Temporal	931	346	144	490
Atlas	507	274	47	321
Axis	747	287	93	380
Other cervical	1,541	258	49	307
Thoracic	3,238	221	49	270
Lumbar	1,460	218	75	293
Sacral	182	182	?	182+
Sternum	404	122	46	168
Clavicle	908	214	129	343
Scapula	907	232	135	367
Humerus	1,591	295	217	512
Radius	951	196	151	347
Ulna	1,169	307	152	459
Pelvis	1,753	198	156	354
Femur	1,176	223	172	395
Patella	484	250	?	250+
Tibia	981	207	147	354
Fibula	850	177	83	260
Talus	769	354	40	394
Calcaneus	675	281	69	350

their chances of recovery when the primary burial was exhumed prior to the "Feast of the Dead," and also their ability to remain comparatively undamaged in spite of the trauma of ossuary burial.

Bones such as the talus and patella are commonly recovered in good condition because of their strength, but their small size decreased their chance of being found when the primary burial was exhumed prior to the "Feast of the Dead." The femur, although the longest and strongest bone, is handicapped by its length, which enhances the leverage of the weight of the bones and earth above it in the pit and often leads to multiple fracturing of the shaft. Large articular surfaces such as the head of the femur are easily damaged because they consist of a thin veneer of compact bone covering a delicate cancellous interior. The temporal bone is well represented because of the careful recovery of skulls that would have occurred prior to ossuary burial, because of the hardness of its petrous part, and because of its loose non-interlocking attachment to the rest of the skull which allows it to fall away unbroken if the skull vault is shattered.

Based on the inventory of humeri, the minimum number of individuals recovered is 512. Without allowing for deaths away from the region or for individuals not buried in the ossuary, and on the assumption that the associated site had been occupied for ten years, this figure suggests an annual death rate of about fifty persons.

Age determination

The differences shown in Table 1 for the estimation of the ratio of immature to adult skeletons can be explained by the relative fragility of different bones as well as by the different criteria used to determine their maturity. The minimum number of immature individuals represented by temporal bones is 144, while that determined by the number of young humeri is 217. However, the temporal bone would be classed as mature when full length of the tympanic plate growth has been reached (this occurs prior to puberty); whereas a humerus would be classed as immature until fusion of its proximal epiphysis at the end of adolescence. Using these two numbers, therefore, the following primary breakdown of age groups at this site is suggested:

Pre-pubertal (based on immature temporal bones) – 144 (28%)

Adolescents (the difference between 217 young humeri and 144 immature temporals) – 73 (14%)

Adults (the difference between the previous two groups and the total estimate of 512) – 295 (58%)

Because of their very small size and the fragility of the bones, one may assume that more infant deaths occurred than were recovered in the ossuary. However, in the number recorded, the pre-pubertal group may be further subdivided by examining other bones of the skeleton. For example, all parts of immature axis vertebrae were grouped in a developmental sequence based on the fusion of parts and the formation of foramina. From this study, the following breakdown within the immature group was made for the first twelve years of life:

age	*per cent*
Under one year	19
1 – 3	53
3 – 8	10
8 – 12	18

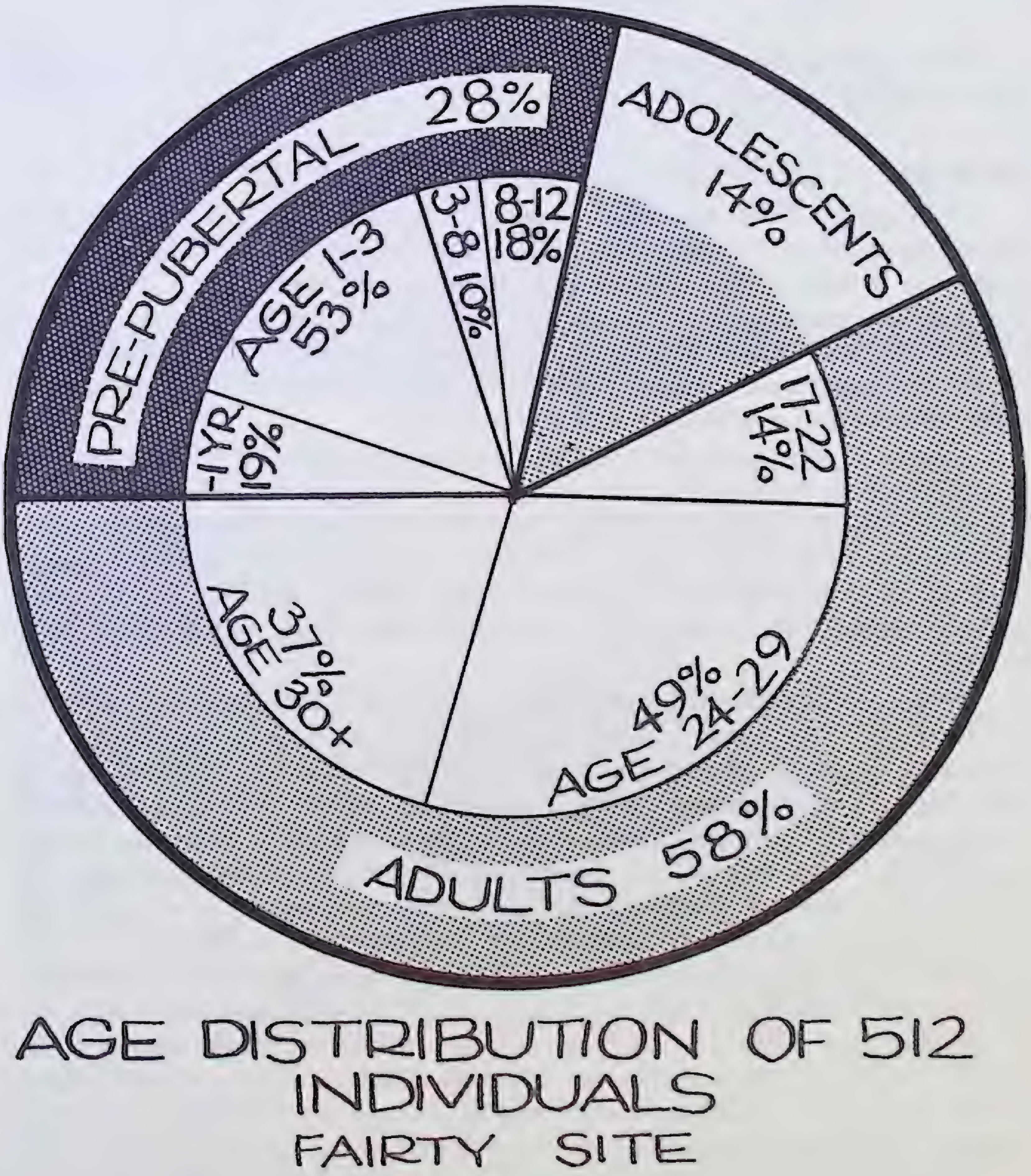


FIGURE 1. Age distribution

As might be expected, the highest mortality rate in childhood is in the first three years of life.

After study of all available specimens of the symphysis pubis in the samples, the adult group of bones was further subdivided, using the method of McKern and Stewart (1957). A rough outline is as follows:

age	*per cent*
17 – 22	14
24 – 29	49
Older	37

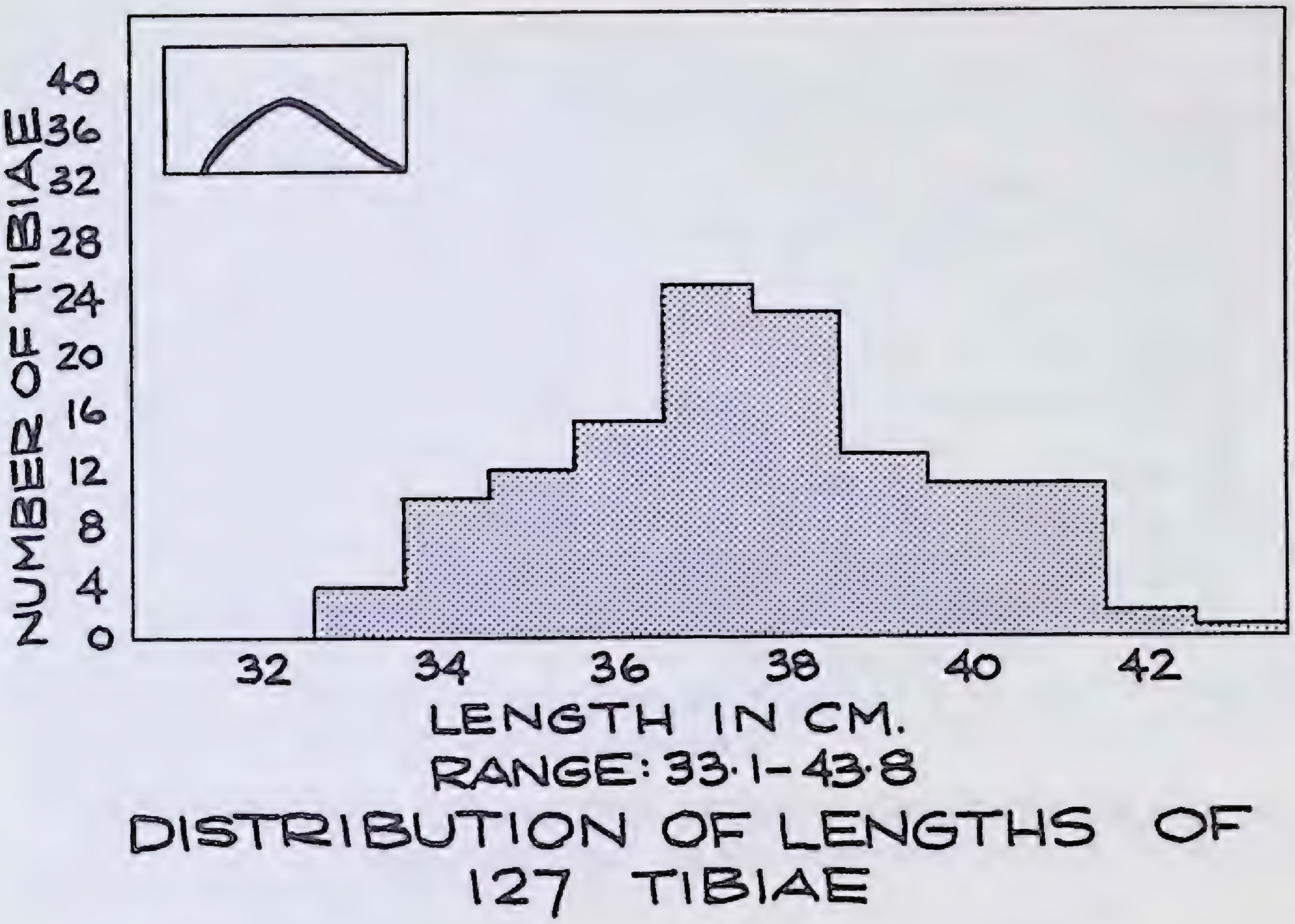
This subdivision of the Fairty population according to age is illustrated graphically in Figure 1.

Sex ratio

It is a general rule that the bones of the infracranial skeleton are longer and more robust in the male than in the female. It has also been shown by numerous workers that articular surfaces are relatively and absolutely larger in the male than in the female. The possibility of using this sort of information was explored using measurements of length and joint surfaces for all the long bones of upper and lower limbs. Some of the results have been summarized graphically in Figures 2 to 6.

Figure 2 consists of two histograms of the distribution of the lengths of two of the long bones, tibia and humerus. It may be seen that the distribution curves are unimodal with a wide central zone. Although no doubt the extremes of the distribution curve represent extremes of male and female bone lengths, there is a wide range of overlap between the long female bones and the short male bones. The use of such data is of very limited value indeed.

Figure 3 illustrates the range and frequency distribution of two different dimensions of the femur, diameter of the head, and total length. As with tibia and humerus, there is a continuous distribution of femoral lengths resulting in a unimodal curve, in this case with a high central peak. Again, one may assume that the extremes of the curve represent extremes in male and female bones, but such is the extent of the value of this dimension for sex determination. A somewhat different picture emerges, however, in the histogram representing the distribution of femoral head diameters. Here, the curve produced is bimodal, suggesting a heterogeneous collection of data composed of two series, each with a different distribution curve producing its own peak. The two curves overlap in the central region of the graph where one might assume that values for the smaller male and larger female femora are added to each other. The peaks represent the modal values for male and female femoral head diameters. This information still is of limited value, however, as the two curves are close to each other, and separation of the two series from each other is, therefore, not possible.



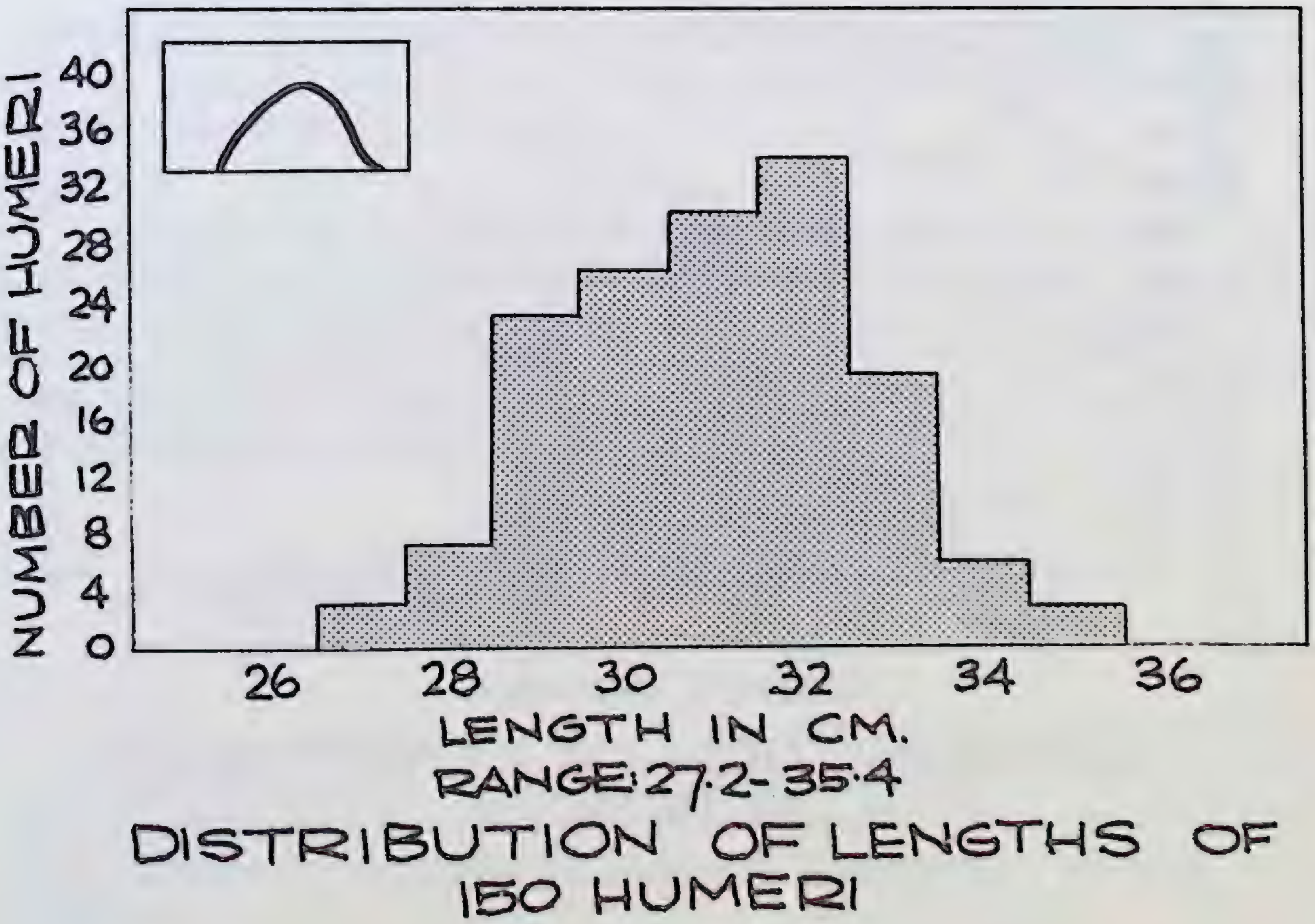
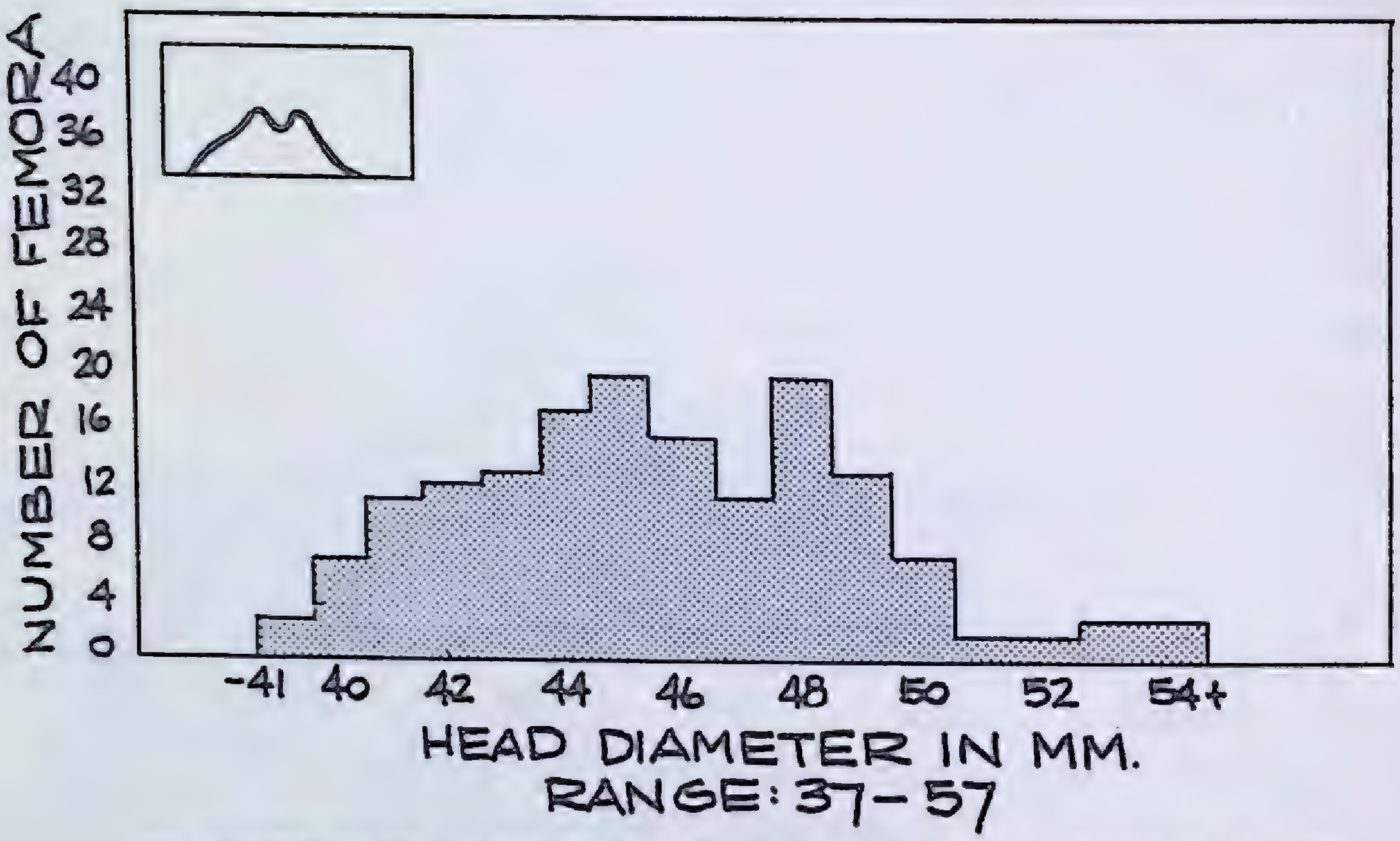
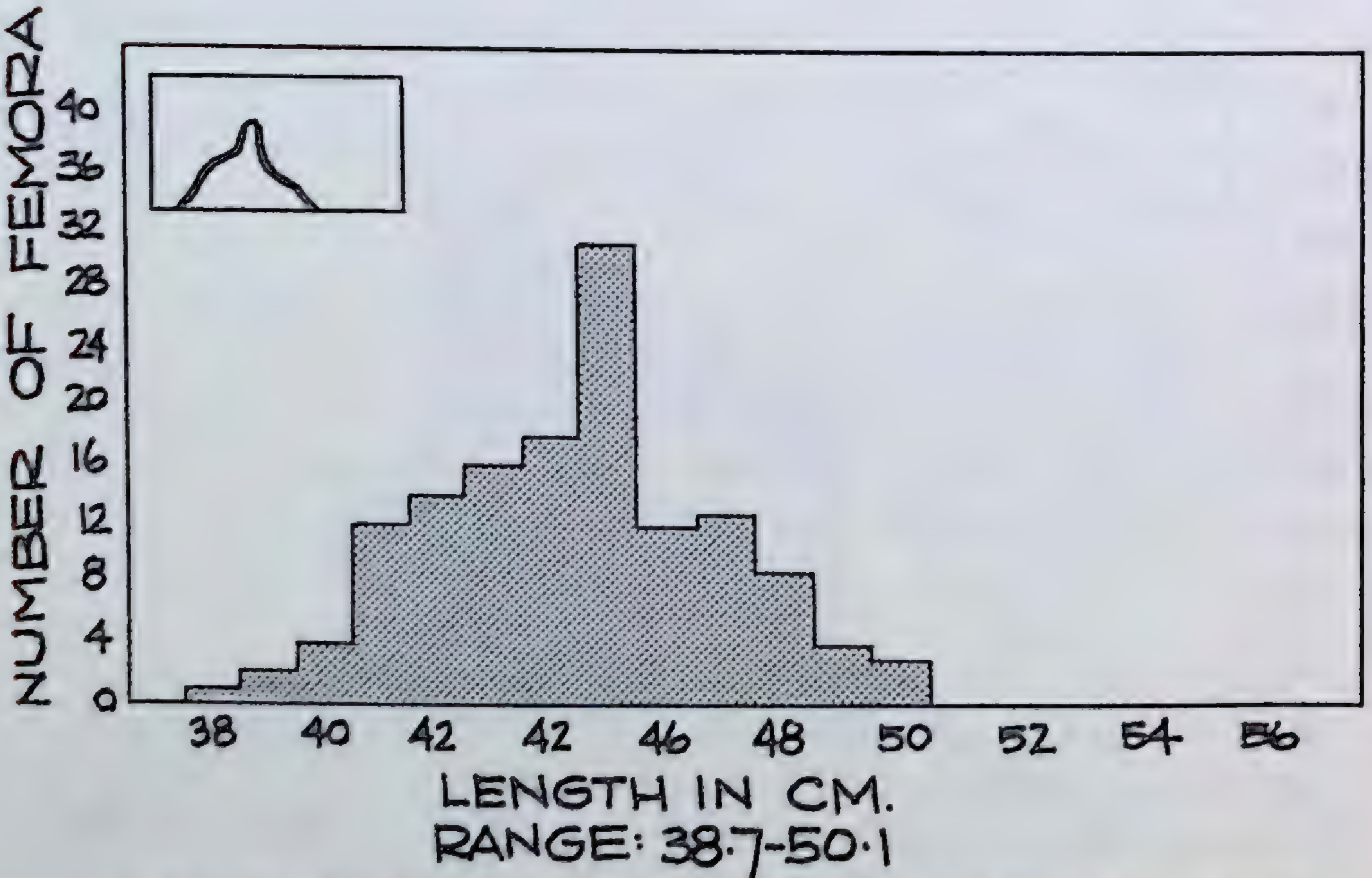


FIGURE 2. The lengths of tibia and humerus



DISTRIBUTION OF HEAD DIAMETER OF 155 FEMORA



DISTRIBUTION OF LENGTHS OF 139 FEMORA

FIGURE 3. Dimensions of the femur

Figure 4 provides similar information on humeral head diameters. The distribution curves for maximum and minimum diameters are both bimodal, but the former is ragged and irregular with very ambiguous separation, perhaps at 43 mm. More informative is the histogram of minimum head diameters. The two peaks are separated by a valley which occurs at 41 mm. On either side of this valley, two curves rise with very slight apparent overlap. Additional data show that there is a significantly smaller difference between maximum and minimum humeral head diameter in females than in males, i.e., the female humeral head is rounder than that of the male. The use of this information in conjunction with these two graphs appears to have some value in sex determination based on the humerus.

Figure 5 shows the irregularly bimodal distribution of measurements made on two bones, which reflect, at least in part, articular surfaces. The patellar module—the average of length, breadth, and thickness of the patella—is an indication of the size of its surface for articulation with the distal end of the femur. The anterior height of the axis vertebra includes its body and the odontoid process which articulates with the anterior arch of the atlas. Although bimodal, the curve shows poor separation between two series.

Using the data from Figure 4, the ratio of female to male adult humeri at this site is 50:50. It is significant that this resembles very closely the ratios derived from three other bones:

42 reconstructed intact skulls..........	48:52
50 intact sacra........................	56:44
191 innominate bones..................	54:46

From the limitations of the material and methods, it would appear that the sexes are almost equally represented in this site, with perhaps a slightly greater number of females.

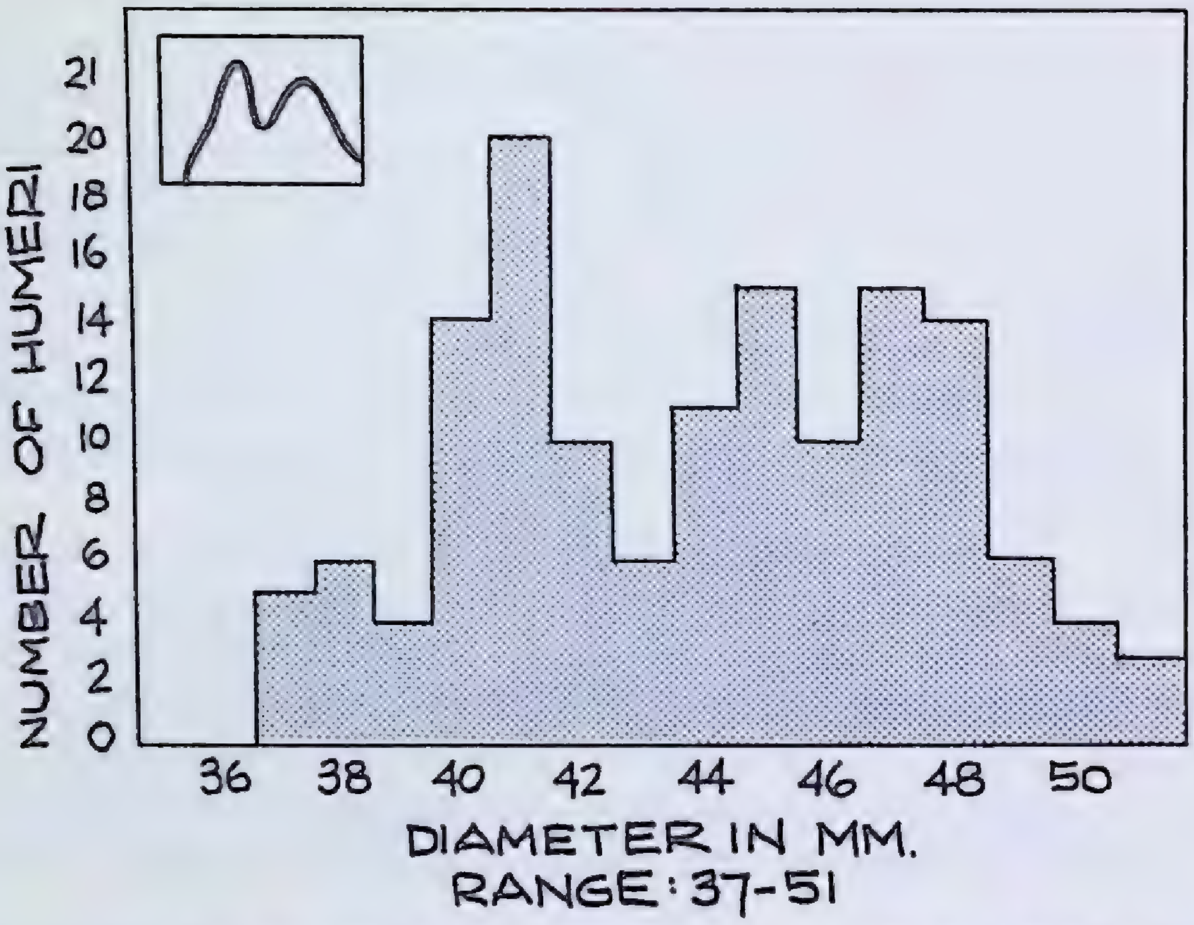
Stature

Because of the impossibility of accurate separation of the sexes from long bones, stature determination was done on the complete series. The method of Trotter and Gleser (1958), which is based on the male skeleton, was used. Since pairing of long bones from the same individual is not possible, the femur was chosen as it is the most reliable single bone for stature determination. The values reported are ± 3.80 cm.

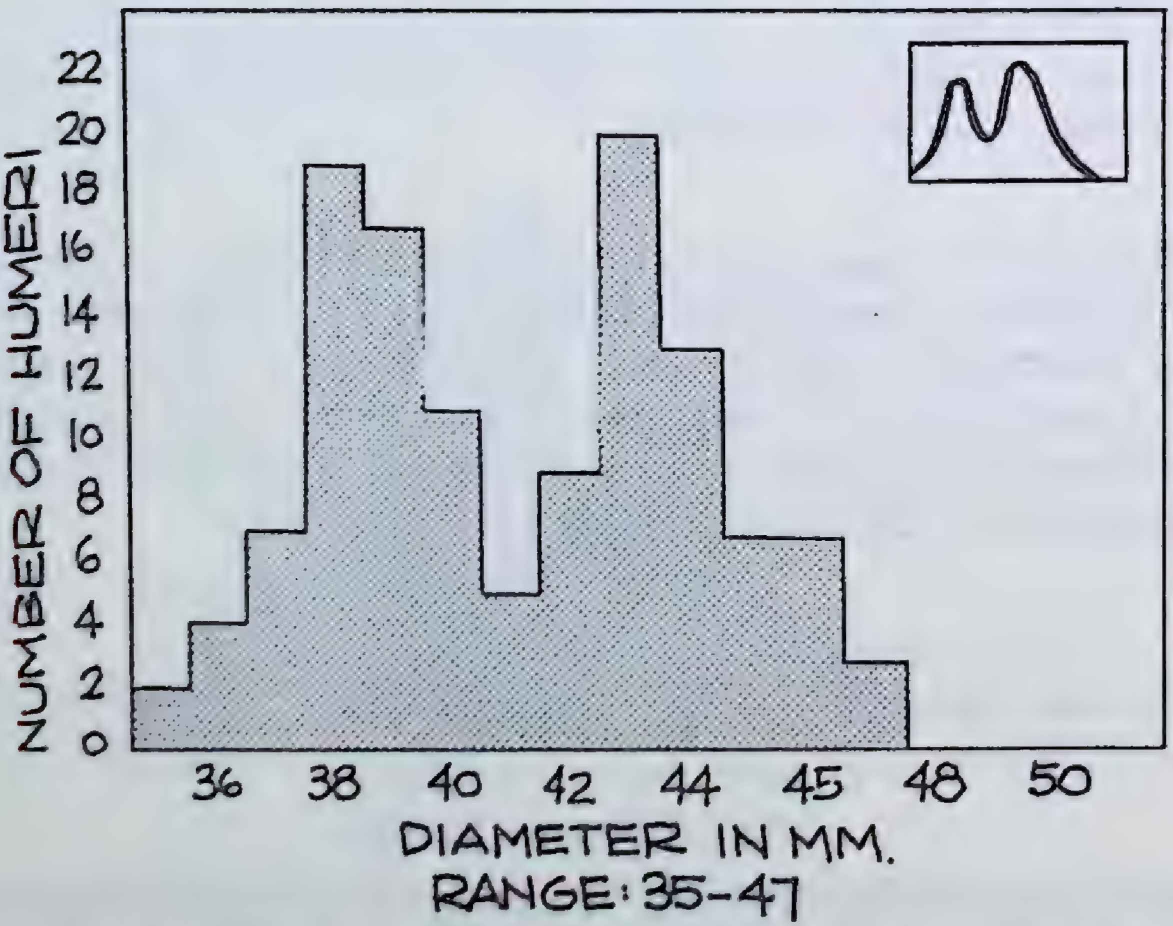
	cm	*inches*
Minimum................	155.8	61.3
Maximum................	180.3	71.0
Mean...................	169.3	66.7

III. THE SKULL

The skulls recovered were severely damaged; only 54 could be partially or completely reconstructed. Of these, smaller numbers were available for the standard cranial measurements. Both the intact crania and over 2,000 skull fragments were used for study of morphology, variation, and pathology.

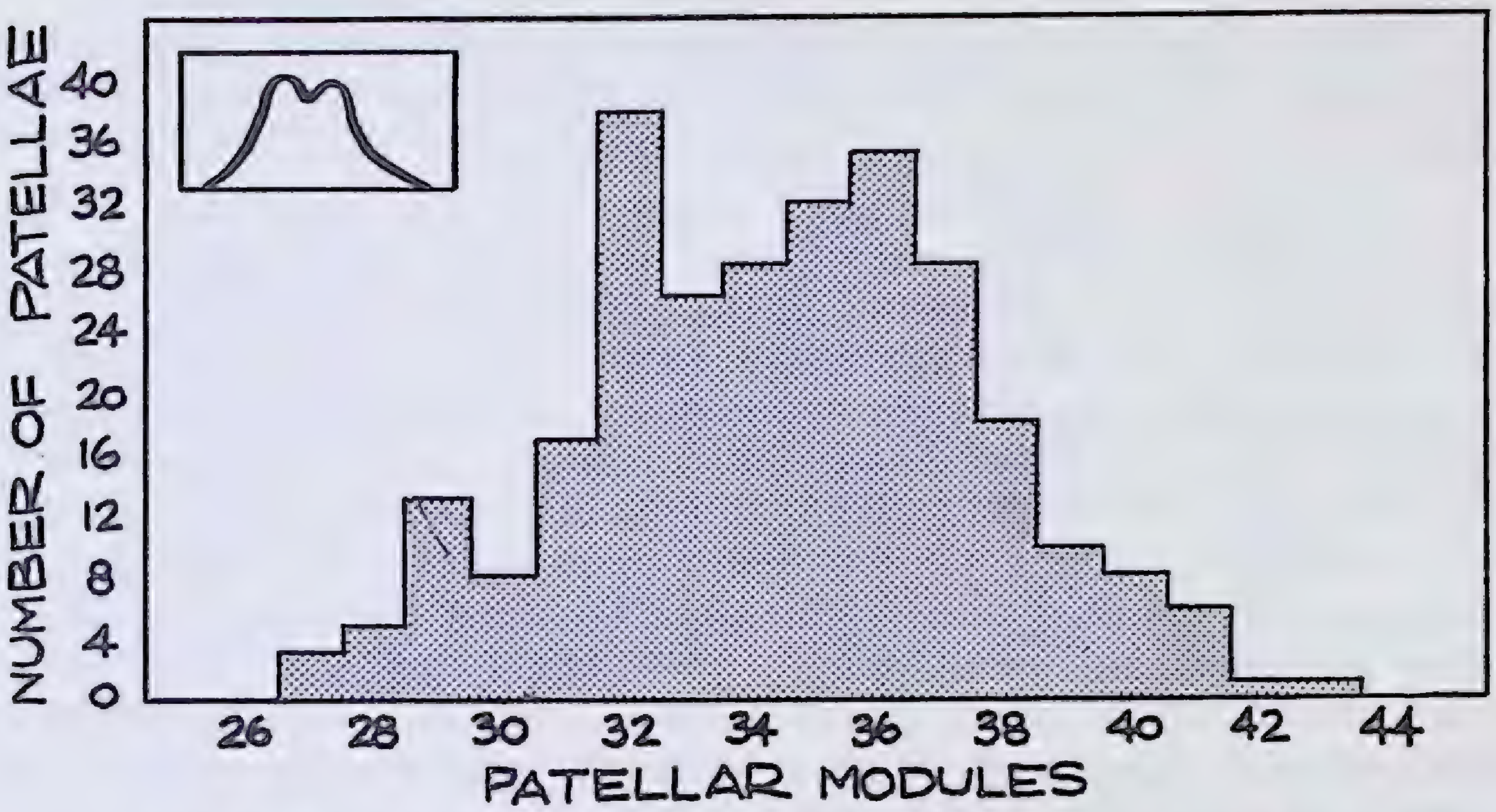


DISTRIBUTION OF HUMERAL HEAD MAXIMUM DIAMETERS

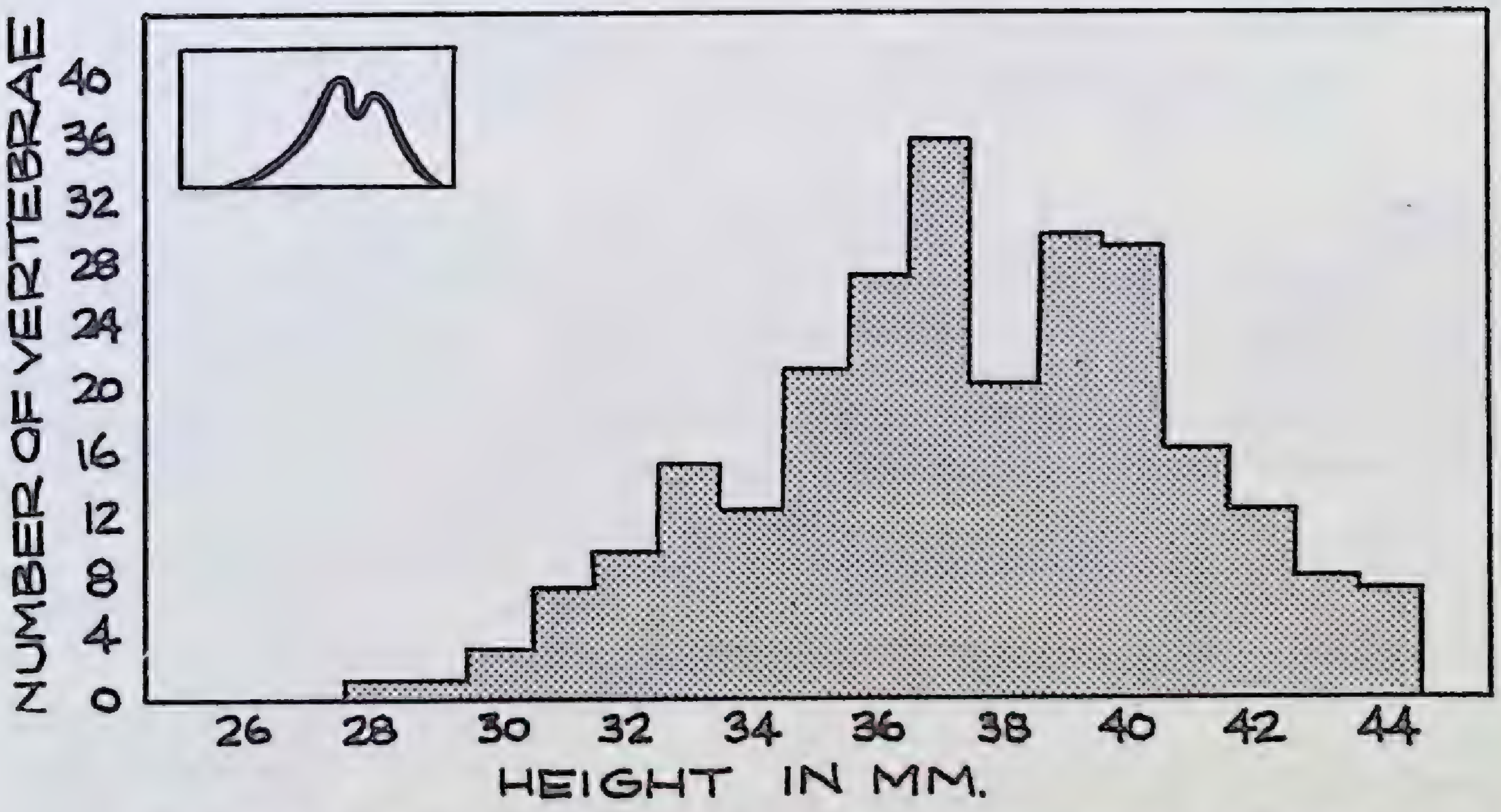


DISTRIBUTION OF HUMERAL HEAD MINIMUM DIAMETERS

Figure 4. Humeral head diameters



DISTRIBUTION OF 267 PATELLAR MODULES



DISTRIBUTION OF ANTERIOR HEIGHTS OF 254 AXIS VERTEBRAE

Figure 5. Patellar module and axis height

Craniometry

Because of the small series and the reconstructed nature of the material, craniometric information is of minor consequence in the study of this sample. The measurements and indices are summarized in Table 2.

The crania are large and fairly robust. They are mesocranial, with a mean *cranial index* of 76.8 and a greater tendency to dolichocrany than to brachycrany. The *height/length index* has a mean of 75.0 at the lower limit of hypsicrany. The male skulls tend to be higher in relation to their length than female skulls, most of which are orthocranic. The mean of the *height/breadth index* values lies at the upper end of the metriocranic range. Half of the skulls are rather high in relation to their breadth (acrocranic), and half are metriocranic. The *upper facial index* indicates a face rather long in relation to its breadth. *Nasal indices* are in the upper mesorrhine or platyrrhine categories; the nasal region is broad in relation to its height. The *orbital index* shows that all orbits are chamaeconchic or low in relation to their breadth. Their shape is more nearly rectangular than square. Two views of skull Number 24 are shown in Plate I.

TABLE 2. *Craniometry*

Measurement	MALE				FEMALE			
	Number	Range	Mean	S.D.	Number	Range	Mean	S.D.
Length	19	173–204	186.2	5.05	20	172–186	179.6	4.19
Breadth	15	136–150	143.3	5.14	19	132–143	137.2	3.15
Basion-bregma	14	133–148	141.0	5.21	10	125–140	132.6	4.54
Cranial module	12	150–163	156.6	3.98	9	146–155	149.7	2.75
Auricular height	6	114–124	118.3	3.30	5	105–118	112.6	4.22
Frontal breadth	18	83–102	96.2	4.79	18	86–98	93.1	3.09
Bizygomatic diam.	4	131–150	142.0	6.96	2	121–133	127.0	6.00

Index	Number	Range	Mean	S.D.
Cranial index	33	70.6–84.4	76.8	2.77
Height/length index	23	69.4–80.8	75.0	3.03
Height/breadth index	22	89.3–104.3	97.3	2.63
Total facial index	1	–	89.5	–
Upper facial index	4	53.4–57.0	54.3	2.63
Nasal index	6	50.0–55.8	52.8	2.05
Orbital index	6	72.7–82.9	78.6	3.41
Maxillo-Alveolar index	8	105.4–126.0	116.1	6.51

The mean cranial measurements and indices compare quite closely with those of the Tabor Hill ossuaries (Churcher and Kenyon: 1960) and with those of the Roebuck site (Knowles: 1937) as shown in the following data on male crania.

	Fairty	*Tabor Hill*	*Roebuck*
Cranial length	186.2	184.5	188.7
Cranial breadth	143.3	144.3	147.0
Basion-bregma	141.0	136.2	142.0
Cranial module	156.6	155.0	159.0
Bizygomatic diameter	142.0	140.6	144.0
Cranial index	77.3	78.2	77.9
Height/length index	75.8	73.9	75.5
Height/breadth index	97.4	94.4	96.6
Upper facial index	55.2	52.7	52.0
Nasal index	52.2	50.2	48.0

Frontal region

The *supraorbital ridges* take the form of a *V* overlying the root of the nose and the medial part of the orbit. They do not blend with the supraorbital margin. *Supraorbital notches* are slightly less common than foramina. One-third of cases have a supraorbital notch on one side and a foramen on the other. In 28 per cent of orbits, multiple supraorbital foramina are present. They are usually two in number, occasionally three. Sixty-three per cent of crania show grooves in the frontal bone to accommodate the supraorbital vessels and nerve during part of their course. When present, they are more commonly bilateral.

A *metopic suture* persists in 2.2 per cent of adults (Plate II-A).

Temporal region

There is a *dehiscence in the tympanic plate* of 39 per cent of adult temporal bones. In most cases this consists of a rather large foramen in the central part of the plate. Rarely, it appears as a cribriform area. In two adult temporal bones out of 193 that could be studied for this feature the tympanic plate has failed to form. The tympanic plate shows no thickening of its lateral margin, and no auditory exostoses are present. The external auditory meatus is usually oval in shape.

Of mastoid processes, 35.6 per cent show well-marked notches on their margins.

The mandibular fossa is generally quite deep, but the post-glenoid tubercles are not large. Signs of *arthritis* are present in 31.4 per cent of temporomandibular joints. In its early stages, this appears as a pitted area on the articular eminence. More advanced cases have a large lipped plaque of new bone extending anteriorly on the eminence. There is an evident relationship between the high incidence of joint disease and abnormal occlusion due to loss of teeth. For example, skull number 24, whose jaw joints show advanced arthritic changes, has asymmetrical attrition on the few remaining teeth, with a chisel-like mesio-distal occlusion of the upper and lower dental arches.

Occipital region

The occipital pole of the skull is generally mound-shaped. Accentuation of the superior nuchal line in males adds a ridge to the summit of this mound. The inion is usually midway between the posterior border of the foramen magnum and the lambda. *Wormian bones* are present in 16 per cent of lambdoid sutures. Six per cent more show a small triangular accessory bone at the lambda, which has apparently formed within the membrane of the posterior fontanelle. In some cases, the inferior suture of this lambdic bone has become obliterated, and the presence of this structure is only discernible by the anterior bulging of the lambdoid suture near the mid-line. Another 6 per cent of adult skulls have an *os inca*, the large unfused upper portion of the squamous part of the occipital bone.

Grooves on the interior of the occipital bone show that the superior sagittal venous sinus deviated to the right side in 73 per cent of skulls, and to the left in 18 per cent. In the remainder, a confluens sinuum was present.

Precondylar tubercles occur in 4 per cent of occipital bones. In another 8 per cent, very tiny tubercles are present in the anterior region of the foramen magnum, but they seem hardly large enough to merit classification as precondylar tubercles. The occipital condyles show minimal amounts of *arthritic lipping* in 16 per cent of skulls.

No examples of paramastoid process have been found on the occipital fragments, but on one atlas there is a facet which apparently articulated with a large process.

The sphenoid bone

Because of its delicacy the sphenoid bone is represented by very few fragments that can be studied; statistical treatment of the findings, therefore, is not possible. However, almost all available sphenoids show signs of anomalies in the region of the clinoid processes. These are of three sorts: carotico-clinoid canals, where a tunnel for the internal carotid artery is formed by a spur of bone uniting the body of the sphenoid and the anterior clinoid process; a bridge of bone linking anterior and posterior clinoid processes; and a combination of these two variations. Examples are illustrated in Plate IV.

Pterygoid foramina are absent on the 21 skulls with intact base, and none was found in the cranial fragments.

The skull vault

The usual form of the vault is oval with slight frontal and occipital bossing. A slight sagittal crest is rarely present. Two skulls are somewhat deformed through occipital flattening.

The facial skeleton

The facial skeleton is rather large with flaring zygomas. The orbits show only slight inclination from the horizontal plane.

The nasal profile, in the few undamaged specimens, is concavo-convex. In approximately half of the crania the subnasal margin is blurred.

The mandible

The mandibles are rather robust with slight gonial eversion and medio-bilateral chin form. The mental foramina point upwards and backwards and are multiple on 2.2 per cent of sides. Examples of a *mylohyoid arch* show in 11.9 per cent. There are no examples of strong *mandibular tori.*

Of the mandibular condyles, 7.9 per cent show arthritic involvement, with pitting, flattening of the convexity, and peripheral lipping.

The dentition

Statistical study of dental variation and disease in this collection is potentially misleading because of the great amount of pre- and post-mortem tooth loss, the fragmentary nature of the jaws, and the difficulty in specific identification of loose teeth with advanced caries or attrition. A study was made of almost 1,700 loose teeth that had been lost after death as well as the teeth still remaining in maxillary and mandibular dental arches.

The incisor teeth are characteristically shovel-shaped. The only anomalous tooth found is a peg-shaped upper lateral incisor (PLATE VII-C). *Carabelli's cusp* is present in 37 per cent of permanent upper molars. Its form is variable: a slight tubercle in 9.2 per cent, a groove in 13.7 per cent, and a pit in 14.5 per cent.

There is a parastyle on 2 of 131 upper permanent molars. Of premolar teeth, 1.8 per cent have two roots.

Enamel extensions occur on the exterior of the cementum in 29 per cent of upper molars and in 49 per cent of lower molars. These usually take the form of delicate strips of enamel extending between the roots; however, half of those seen on upper molars are tiny, discrete, and pearl-like.

Premortem loss of teeth has occurred in 44 per cent of maxillae and in 77 per cent of mandibles. About 20 per cent of jaws are edentulous and 29 per cent show evidence of infection with periodontal disease and abscess formation. Molars have the highest incidence of premortem loss, followed by incisors, premolars, and canines.

The incidence of *caries* in remaining teeth is—

	per cent
Lower molars....................	62
Upper molars....................	53
Premolars.......................	13
Canines.........................	7
Incisors........................	6

Although advanced *attrition* is common in the anterior teeth, it is not characteristic of the whole dentition in this collection. More than half of the molars and premolars show only slight blunting of the cusps, one quarter have attrition extending into the dentin, and the remainder have extensive wear.

Hypercementosis, the development of secondary cementum on the exterior of the root, is a common finding; its incidence is as follows:

Tooth	*Hypercementosis per cent*
Upper molars	47
Lower molars	35
Canines	20
Premolars	19
Incisors	7

IV. THE VERTEBRAE AND STERNUM

The atlas

The first cervical vertebra, because of its delicate structure, survives ossuary burial very poorly. Most of the material studied consists of atlas halves, due to breakage of both anterior and posterior arches.

The *superior articular facets* of the atlas are large, concave, and kidney-shaped. Most commonly, each bears a single area for articulation with an occipital condyle. However, in some cases this area is constricted centrally to form a facet of hour-glass shape. Less commonly, each facet bears two discrete articular surfaces (PLATE VIII-A).

Form of facet	*Right side* %	*Left side* %
Single	80.7	79.3
Constricted	16.0	20.2
Double	3.3	0.5

The term *spina bifida* denotes the condition that exists when the right and left neural arches fail to fuse with each other. This occurs in 5.6 per cent of atlas vertebrae from the Fairty site (PLATE IX-B). The *costal element* that forms the anterior part of the lateral mass is defective unilaterally in 4.2 per cent of cases (PLATE VIII-B), and 2.8 per cent of specimens have anomalous foramina in the costal element. One specimen from this site has a large facet for articulation with a *paramastoid process* on the jugular process of the occipital bone (PLATE X-C). There are two examples of *atlanto-occipital fusion.*

In life, the vertebral artery passes through the foramen transversarium of the atlas, runs behind the superior articular process in a groove on the posterior arch, and enters the base of the skull through the foramen magnum. Localized outgrowths of bone in the region may form a partial or complete *canal for the vertebral artery.* Bridging from the posterior arch to the superior articular process occurs in 18.6 per cent of atlas vertebrae from this site. Half of these consist of a spur that forms an incomplete canal for the vertebral artery (PLATE VIII). Another 7.5 per cent have a bridge running from the transverse process to the superior articular process, half of which form incomplete canals.

Osteoarthritic changes occur in 7.1 per cent of superior articular facets and in 17.1 per cent of inferior articular facets. Arthritic lipping is present around the facet for the dens in 38.7 per cent of atlas vertebrae (PLATE XII-A).

The axis

PLATE X-A illustrates three variations in the form of the *spinous process* of the second cervical vertebra. Their incidence is tabulated as follows:

	per cent
Non-bifid	23
Bifid: divergent	37
Bifid: parallel	40

Of axis vertebrae from this site, 2 per cent are *fused* to the third cervical vertebra (PLATE XII-B).

Osteoarthritis is present in 2 per cent of superior, and 7 per cent of inferior articular facets. Five per cent show degenerative changes on the articular surface of the dens. There is *ossification of the apical ligament* in 27 per cent (PLATE X-B).

Other cervical vertebrae

The *foramen transversarium*, the upper six of which transmit the vertebral artery, is extremely variable in size and shape. It may be large and round, partially divided by tiny spurs of bone—double, constricted, or absent.

Type of anomaly	Side	C3 to C6	C7
		%	%
Spurs	Left	3	16
	Right	8	20
	Bilateral	1	3
Double foramen	Left	10	15
	Right	9	13
	Bilateral	10	8
Foramen absent	Left	1	2
	Right	1	0
	Bilateral	0	0

It may be noted that foramen transversarium anomalies are present in 43 per cent of C3 to C6 vertebrae, and in 77 per cent of C7 vertebrae. Division into double foramina on either or both sides occurs in 29 per cent of midcervical vertebrae, and in 36 per cent of 7th cervical vertebrae (PLATE XI-B). These anomalies are also found in immature vertebrae as well as in the adult.

Asymmetry in size of the superior articular facets may be observed particularly in the 7th cervical vertebra.

Size comparison	*C3 to C6* %	*C7* %
Right = Left	66	36
Right larger	13	41
Left larger	21	23

Osteoarthritic involvement of the cervical apophyseal joints is common, usually unilateral, and affects the left side twice as often as the right. The highest incidence is at the inferior articular facet of C7. Affected joint surfaces appear pitted centrally and have varying degrees of peripheral lipping (PLATE XII-C). The percentages of vertebrae affected are shown below:

	C3–C6 %	*C7* %
Superior articular facets	29	3
Inferior articular facets	18	32

Osteophytosis of cervical vertebral bodies is more common than arthritis of the apophyseal joints. Some signs of lipping show in 80 per cent of midcervical and 37 per cent of C7. Usually only one surface of the body is involved. Three specimens show fusion of two adjacent cervical vertebrae.

Other examples of less common anomalies and pathology include a *compression fracture* of C7, a specimen showing fusion of C2-C7 following *inflammatory destruction* of their bodies (PLATE XIV-B), two cases of *cervical rib* (PLATE XIII-A), one cervical *spina bifida* (PLATE IX-A), and one immature vertebra with a *cleft in the body* (PLATE XI-A).

Thoracic vertebrae

Condition	*T1* %	*T2* %	*T3–11* %	*T12* %
Osteophytosis	4	10	34	22
Osteoarthritis	4	12	13	6
Laminal spurs	4	18	46	28
Compression fractures	0	0	1	4

Of the 2,650 thoracic vertebrae studied, there are six examples of *fusion* due to osteophytosis or osteoarthritis (PLATE XV). Seven other specimens consist of vertebral segments fused together following *inflammatory destruction* of the vertebral bodies and resulting in a marked angular kyphosis as is seen in tuberculosis of the spine (PLATE XIV).

Laminal spurs are delicate growths of bone on the vertebral laminae extending superiorly and inferiorly into the region of the ligamenta flava.

A compression fracture of a thoracic vertebral body is illustrated in PLATE XI-C.

Lumbar vertebrae

Condition	*Incidence* %
Osteophytosis	48
Osteoarthritis	7
Laminal spurs	18
Compression fractures	2.3

Spondylolysis is present in 1.8 per cent of the lumbar vertebrae from this site. In one third of the cases the defect in the pars interarticularis is unilateral; in the others, the vertebra is divided into separate anterior and posterior segments (PLATE XVI).

One example each occurs of *spina bifida* and *fusion* of two adjacent lumbar vertebrae. Of 1,086 lumbar vertebral bodies, 0.6 per cent show inflammatory destruction (PLATE XIII-B).

The anterior and posterior heights of fifty 5th lumbar vertebrae have been measured:

		mm
Anterior height—	Range:	25–33
	Mean:	29.2
Posterior height—	Range:	21–28
	Mean:	24.3

Mean Lumbar Index: 83.2

The sacrum

Condition	*Incidence* %
Osteophytosis of S1	22.7
Accessory facets	8.7
Hemisacralization of L5	9.0
Sacralization of L5	1.0
Lumbarization of S1	2.2

There is considerable variability in the superior level of the *sacral hiatus*, as the following summary reveals:

Level	*Incidence* %
Second posterior foramen	1.3
Third sacral body	0
Third posterior foramen	14.8
Fourth sacral body	17.6
Fourth sacral foramen	33.8
Fifth sacral body	32.5

PLATES XVII and XVIII illustrate some variations of the sacrum.

The sternum

Osteoarthritis of the sternoclavicular joint occurs in 10.2 per cent of specimens and appears as an oval area of erosion and porosity on the manubrium.

There is a high incidence of *sternal foramina* (10.2%) near the junction of the third and fourth sternebrae (PLATE XIX-A).

Ossification of the first costal cartilage is present in 30 per cent of this series of manubria (PLATE XIX-C). In 27 per cent, this appears as an expanded cup-shaped bony socket for the reception of costal cartilage; in the other 3 per cent, ossification extends laterally for one inch or more.

V. THE UPPER LIMB

The clavicle

The clavicles range in length from 12.9 to 18.1 cm. Usually the left clavicle is longer than the right. The *medial end* is round in 24 per cent, oval in 59 per cent, kidney-shaped in 11 per cent, and irregular in 6 per cent. A *rhomboid pit* is present in 4 per cent of right clavicles but absent on those of the left. Of the clavicles 84 per cent have a *conoid tubercle*, but in a further 8 per cent there is a flattened facet present at this location.

Osteoarthritis affects 38 per cent of lateral ends. In such cases, the acromioclavicular joint surface appears pitted with peripheral lipping that produces a larger distorted articular area. The medial end of the clavicle is less often involved; 8 per cent show minimal erosion on the anterior half of the articular surface with no significant side difference.

The scapula

Because of the delicacy of the body of the scapula, observations of its general form are not possible. Information has been pieced together from a study of fragments.

The most common *shape of the acromion* is rectangular (67%). Other forms represented are triangular (24%), sickle-shaped (8%), and irregular (1%). An *articular facet* is present on the inferior surface of the acromion in 15 per cent of cases. One specimen (PLATE XX-D) out of 180 that could be studied has an *unfused acromial epiphysis.* There is *arthritic* involvement of 25 per cent of clavicular facets.

The *glenoid fossa* is characteristically piriform, with well-marked notching of its anterior margin. Sixty-eight per cent of scapulae show a definite extension of the postero-superior part of the glenoid fossa as illustrated in PLATE XX-A. An additional 22 per cent have a well-marked plaque in this location. There are signs of *arthritis* in 46 per cent of glenoid fossae, usually taking the form of minimal lipping of the margin (PLATE XX-C).

The *suprascapular notch* is converted into a foramen in 2.5 per cent of scapulae (PLATE XX-B), and a sulcus is present for the *circumflex artery* in 62.5 per cent.

The humerus

The commonest anomaly of the humerus is the *septal aperture,* a foramen in the coronoid fossa, which is present in 29 per cent of right and 40 per cent of left humeri (PLATE XXII). It is found in immature as well as in adult bones. A rare anomaly is the supratrochlear process, a small spur of bone on the antero-medial surface near the distal end of the shaft. Only two examples were found, in a young and in a mature humerus (PLATE XXII).

Osteoarthritis of the head is usually minimal and present in less than 10 per cent of humeri. The distal end is involved in 5 per cent of cases but is more extensive. Typically it appears as a round discrete area of erosion on the capitulum with some marginal lipping (PLATE XXI-C).

Three humeri show signs of healed fractures of the shaft, the neck, and the distal end. One humerus has a distorted amorphous proximal end that appears to be the result of *septic arthritis* of the shoulder joint (PLATE XXI).

The radius

Osteoarthritis is present in 9 per cent of proximal and distal articular surfaces. Two left radii have signs of healed *fractures* of the shaft and the distal end (PLATE XXIII-D).

The ulna

Osteoarthritis occurs in 19 per cent of proximal ends and 15 per cent of distal ends. The proximal articular surface usually bears two facets which contact the trochlea of the humerus; however, 26.6 per cent have a single articular facet.

Single examples were found of a double articular facet on the radial notch, an ulna with marked bowing of its shaft, and a healed fracture of the shaft (PLATE XXIII).

The carpus

Carpal bone	*Number*	*Incidence of arthritis* %
Hamate	346	5.8
Capitate	380	4.2
Trapezoid	156	12.2
Trapezium	229	12.7
Scaphoid	413	8.5
Lunate	248	14.5
Triquetrum	162	13.0
Pisiform	55	?

The manifestations of osteoarthritis are minimal in the carpus and consist of slight lipping around the joint surfaces. The exception is the lunate. Almost half show minimal signs of involvement, but in 14.5 per cent severe erosion with or without eburnation is present on the proximal articular surface.

One distorted scaphoid may represent a healed fracture with secondary arthritic changes. The tubercle is intact, but the body is compressed, eroded on its distal surface, and expanded with lipping on its proximal surface.

The hand

Osteoarthritis of metacarpals is present in 2 per cent of proximal ends and 5 per cent of distal ends. Destruction is most severe distally. The phalanges show slight degrees of osteophyte formation near their joint surfaces and some expansion of the distal ends of the middle phalanx.

The most unusual anomaly is a specimen of first metacarpal less than an inch long consisting of proximal and distal joint surfaces fused together with no intermediate shaft. There are many examples of young first metacarpals having both proximal and distal epiphyses.

VI. THE LOWER LIMB

Innominate bones

Sex differences in the pelvis and age changes in the symphysis pubis have already been used in the description of this population.

The upper part of the *articular surface of the acetabulum* in 43 per cent of innominate bones is distorted either through the presence of a pit, a pleat-like groove, or a notch on the acetabular margin (PLATE XXIV-A).

Sacroiliac arthritis is present in 35 per cent of innominate bones, and *accessory sacral facets* occur in 42 per cent.

The femur

The Fairty femora are robust and show moderate degrees of torsion and bowing of the shaft. The *platymeric* index ranges from 64 to 87 with a mean of 75. Almost all are well within the range of platymeria. A prominent *third trochanter* is present in 6 per cent of femora with no side difference.

On the anterior surface of the neck, a succession of changes in appearance can be observed. In young bones where growth and remodelling is taking place, this area consists of uncovered cancellous bone. With age, the site becomes coated with a veneer of compact bone which appears to be filling in from its margin. In this intermediate stage, the area has the appearance of an ulcer with a rolled irregular rim of compact bone surrounding a round porous depression. Some adult femora retain a plaque-like scar, the Fossa of Allen, at the site of this process. Of adult femora 35 per cent show the "ulcer" stage, 7.6 per cent exhibit the Fossa of Allen, and the remainder show no sign of the process (PLATES XXVII, XXVIII).

Osteoarthritis of the head occurs in less than 10 per cent of femora and usually consists of minimal lipping of the periphery of the articular surface and of the fovea for the ligament of the head. In two cases, however, maximum destruction and distortion of the proximal end had occurred.

Osteoarthritis of the distal end is more common (21%), and the changes are more commonly severe. Characteristically, one or both condyles bear a discrete eroded area, and there may be peripheral lipping. One specimen has small round excrescences on the condyles.

The sequelae of *bone necrosis* are evident in two specimens: the mushroom-shaped head of Legge-Perthe's disease and a distorted greater trochanter. A large ossified subperiosteal *hematoma* of the shaft is present in one femur.

Two femora show the signs of advanced *osteomyelitis* with involucrum and cloaca formation. There is one example of a *Brodie's abscess* in the distal end of the femur.

Some of these specimens are illustrated in PLATES XXV and XXVI.

The patella

A total of 484 patellae in good condition were recovered, representing a minimum of 250 individuals. The patellar module ranges from 27 to 43. Figure 5 shows graphically the incidence of the various module values. The undulating curve results from the pooling of large male patellae, small female patellae, and some smaller young patellae that could not be distinguished from mature ones except in size.

The patellae fall into four groups based on the appearance of the area for attachment of the Vastus lateralis tendon in the supero-lateral angle; those groups are as follows:

19.5 per cent have no indication of this muscle attachment;
46.0 per cent bear a definite oval facet on the anterior surface of this angle;
26.5 per cent have a small notch in their outline at the site, the so-called *Vastus notch*;

8.0 per cent show very marked notching of the supero-lateral margin. These emarginate patellae were bipartite in life with a separate ossicle formed from a separate centre of ossification filling in the defect (PLATE XXIX-A).

Fifteen per cent of all patellae studied show evidences of *arthritis.* Lipping of the articular margin is the commonest manifestation, appearing alone or in combination with pitted areas, plaques of new bone, and eburnation (PLATES XXIX C and D).

Sharp, spur-like spicules of bone extend upwards from the anterior surface of 19.5 per cent of the patellae. These *patellar spurs* appear to be extensions of ridges found on that surface, and never appear in the young patellae. In only one-third of cases do they coexist with signs of osteoarthritis. PLATE XXIX-B shows the only specimen in which spur formation occurs inferiorly as well as superiorly.

The tibia

A mean *Platycnemic* Index of 60 expresses the characteristic flattening of the shafts of Fairty tibiae.

There is a significant side difference in the incidence of *osteoarthritis* of the tibia.

	Right %	*Left* %
Proximal..................	20.1	9.2
Distal.....................	5.9	0.5

Pitting and eburnation are characteristic of involvement of the proximal joint surface. Only one specimen shows arthritic lipping of the proximal tibio-fibular joint facet.

There is considerable evidence of infection of the tibia; 2 per cent show signs of *periostitis,* and 1 per cent have involucrum formation and cloacae characteristic of *osteomyelitis* (PLATE XXX).

The fibula

There are no signs of arthritis of the proximal end of the fibula, but pitting and lipping occur in 2.5 per cent of distal articular surfaces (PLATE XXX-D).

Periostitis is present in 1.7 per cent of fibular shafts, and one specimen shows distortion of the shaft with osteophyte formation suggestive of a healed comminuted fracture (PLATE XXX-C).

The talus

The so-called "*squatting facets*" of the talus are extensions of the joint surface for articulation with the tibia. In the Fairty material, medial extensions are present in all but 5 per cent of tali, while half of these medial joint surfaces show marked flaring. Lateral extensions are less common, forming anterior prolongations of the joint surface in 17 per cent of bones. Most of the tali have facets on the neck, some of which are very pronounced and show signs of wear and arthritis.

The diagnosis of arthritic change of the articular surfaces of the talus is difficult because marginal lipping produces the same appearance as the joint extensions described above. No examples of destruction of the articular surface were found.

The incidence of *Os Trigonum* is 9.2 per cent.

The calcaneus

Considerable variation occurs in the form of the anterior and middle *calcaneal facets*. These are illustrated in PLATE XXXII.

34 per cent—Anterior and middle facets form a single oval articular area.
31 per cent—Anterior and middle facets are joined by a constricted intermediate articular area resulting in a single facet of hour-glass form.
33 per cent—Anterior and middle facets are separate and discrete.
2 per cent—No anterior facet is present.

There is emargination of the anterior facet on 1.2 per cent of specimens, and 2 per cent show signs of *osteoarthritis*.

The cuboid

Osteoarthritis occurs in 3.6 per cent which show lipping and pitting of the articular surfaces for the calcaneus and metatarsals.

One specimen (PLATE XXXIII-C) is a cuboid with gross destruction and cavity formation in its interior, perhaps due to *osteomyelitis*.

The cuneiforms

Osteoarthritis is present in 3.5 per cent and consists of minimal lipping around articular facets.

PLATE XXXIII-D shows a specimen in which two adjacent cuneiforms are partially fused to each other.

The navicular

Considerable variation of the posterior surface is present. In 49 per cent, the outline of this surface is oval and regular; in 51 per cent there is a large inferior extension of the joint surface which produced a process rivalling the navicular tuberosity in size. This is illustrated in Figure 6.

In over three per cent of bones the tuberosity is flattened, pitted, and lipped, similar to the appearance of osteoarthritis. Arthritic lipping and tiny areas of erosion occur on the anterior and posterior surfaces of the navicular in 3.4 per cent of cases. Five out of 553 naviculars show marked arthritic destruction on their lateral surface in a facet for articulation with the cuboid.

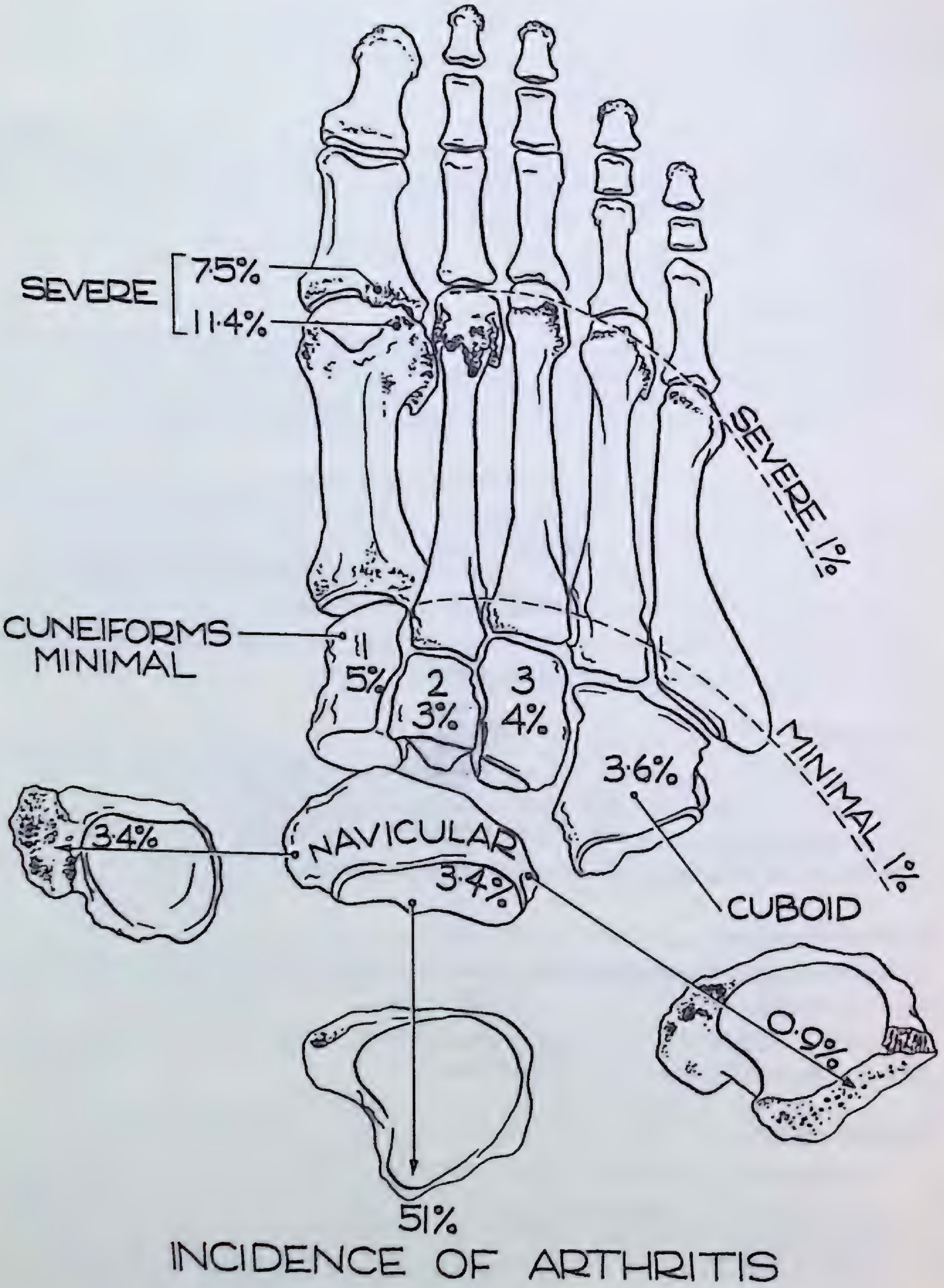


FIGURE 6. Pathology and variations in the foot

The foot

Arthritis of the proximal ends of the metatarsals is minimal and occurs in less than one per cent. Occasionally tiny osteophytes are present (PLATE XXXIII-A). The distal ends of metatarsals 2 to 5 show the same incidence of arthritis, but here the manifestations are severe with eburnation and larger osteophytes. The head of the first metatarsal is affected in 11.4 per cent. Here, erosion and lipping are severe, and eburnation is an almost constant feature.

PLATE XXXIII-B illustrates a specimen of fused metatarsophalangeal joint probably secondary to a fracture. A similar condition occurs in a specimen of the fourth digit. The phalanges show slight osteophytosis and some spreading of the distal phalanges of the great toe.

Figure 6 summarizes some of the information derived from the bones of the foot.

VII. PALEOPATHOLOGY

In the material from this site there is evidence of pathological processes that may be classified as due to trauma, infection, and degeneration.

Trauma

There are 11 specimens of healed fractures in the upper and lower limbs of the 295 adult skeletons. Their locations are as follows:

3—humerus (shaft, neck, and distal end)
2—radius (shaft and distal end)
1—ulna (shaft)
1—patella (?)
1—fibula (shaft)
1—scaphoid
2—1st metatarsal

Compression fractures of the vertebrae occur in one 7th cervical vertebra, in 1 per cent of midthoracic vertebrae, 4 per cent of 12th thoracic vertebrae, and in 2.3 per cent of lumbar vertebrae.

Ossified subperiosteal hematomas, usually small, mark the site of healed minor trauma to the skeleton. They are found on the shafts of long bones, particularly those of the lower limb, and on the vault of the skull.

Disturbance of blood supply to bone, possibly following trauma, is shown in the necrosis of a greater trochanter and the head of a femur.

Infection

The inflammatory process is in evidence in all regions of the body. Osteomyelitis is seen in one mandible, two femora, and four tibiae. Cavitation from abscess formation is present in six lumbar vertebrae, one cuboid, and in a Brodie's abscess at the distal end of a femur. Inflammatory destruction of vertebral bodies has led to their collapse and subsequent fusion in

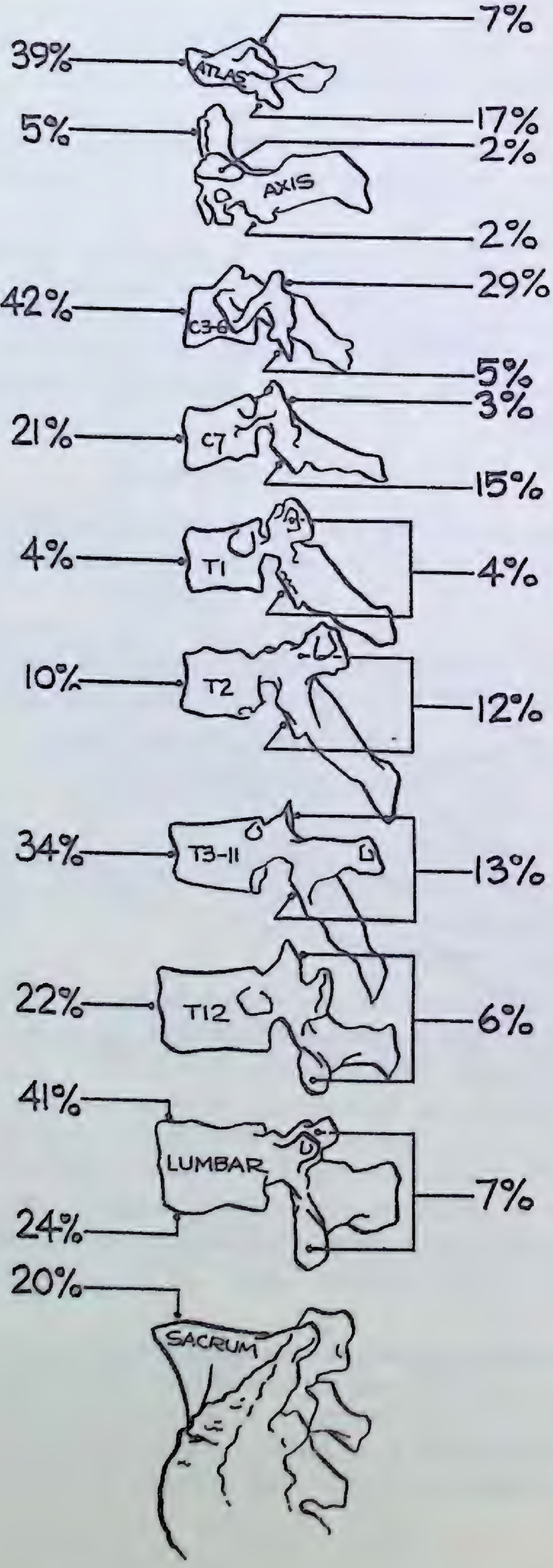


Figure 7. Degenerative disease of vertebrae

eight individuals, one in the cervical region and the others in thoracic vertebrae. There is one case of septic arthritis of the shoulder joint. Periostitis is present in the shafts of eight tibiae and six fibulae.

Periodontal disease and alveolar abscesses are found in 29 per cent of jaws. Premortem loss of teeth through dental disease is universal, and 20 per cent of jaws are completely edentulous. Exposure of the pulp chamber subsequent to dental caries has provided a portal for the entry of infection to the periodontal tissues.

Degenerative changes

The commonest pathological conditions seen in this population are the signs of degenerative changes.

Figures 7 and 8 summarize the incidence of these conditions at the various regions of the skeleton. The classification used throughout this report differentiates between *osteoarthritis*, secondary to soft tissue involvement at synovial joints, and *osteophytosis*, irregular ossification into fibrous tissue around the periphery of vertebral bodies.

A number of generalizations arise from study of the data:

1. *There is a distinctive pattern for each joint surface.*

The manifestations of osteoarthritis when it extends to bone are the lipping of the periphery of the articular surface, the pitting of the bone underlying articular cartilage, the formation of plaques of new bone on the joint surface, and the grinding and polishing of that surface, a process called eburnation. For each joint there is a distinctive typical combination and localization of these manifestations.

Arthritis of the jaw joint begins with a discrete eroded area on the articular eminence, which later becomes expanded by a large oval plaque of bone with marginal lipping. The condyle of the mandible becomes flattened and distorted. Osteoarthritis at the distal end of the humerus typically appears as a round area of erosion on the capitulum. For each joint surface, there is a recurring predictable appearance.

2. *There is great variation in the incidence at the various joints.*

The incidence is very high at the shoulder, hip, and acromioclavicular joints; it is comparatively low at the elbow, wrist, and ankle. There is no apparent relationship between intensity and weight bearing. The high incidence at the jaw joint is worthy of mention.

3. *There is a different incidence in the two bones involved in the same joint.*

Lipping of the facet for the dens occurs in 39 per cent of atlas vertebrae, but the dens is involved in only 5 per cent of cases. The acetabulum is affected in 45 per cent of innominate bones, but the head of the femur in less than 10 per cent. The medial end of the clavicle shows signs of arthritis in only 8 per cent of cases, but its socket on the manubrium is involved in 21 per cent.

The only pertinent generalization that can be made on these differences in incidence is that concave surfaces appear to be affected more often than convex ones.

4. *Some differences in incidence occur between right and left sides.*

The left cervical apophyseal joints are affected twice as often as the right. In the upper limb there is a higher incidence on the left, and in the lower limb the opposite is true.

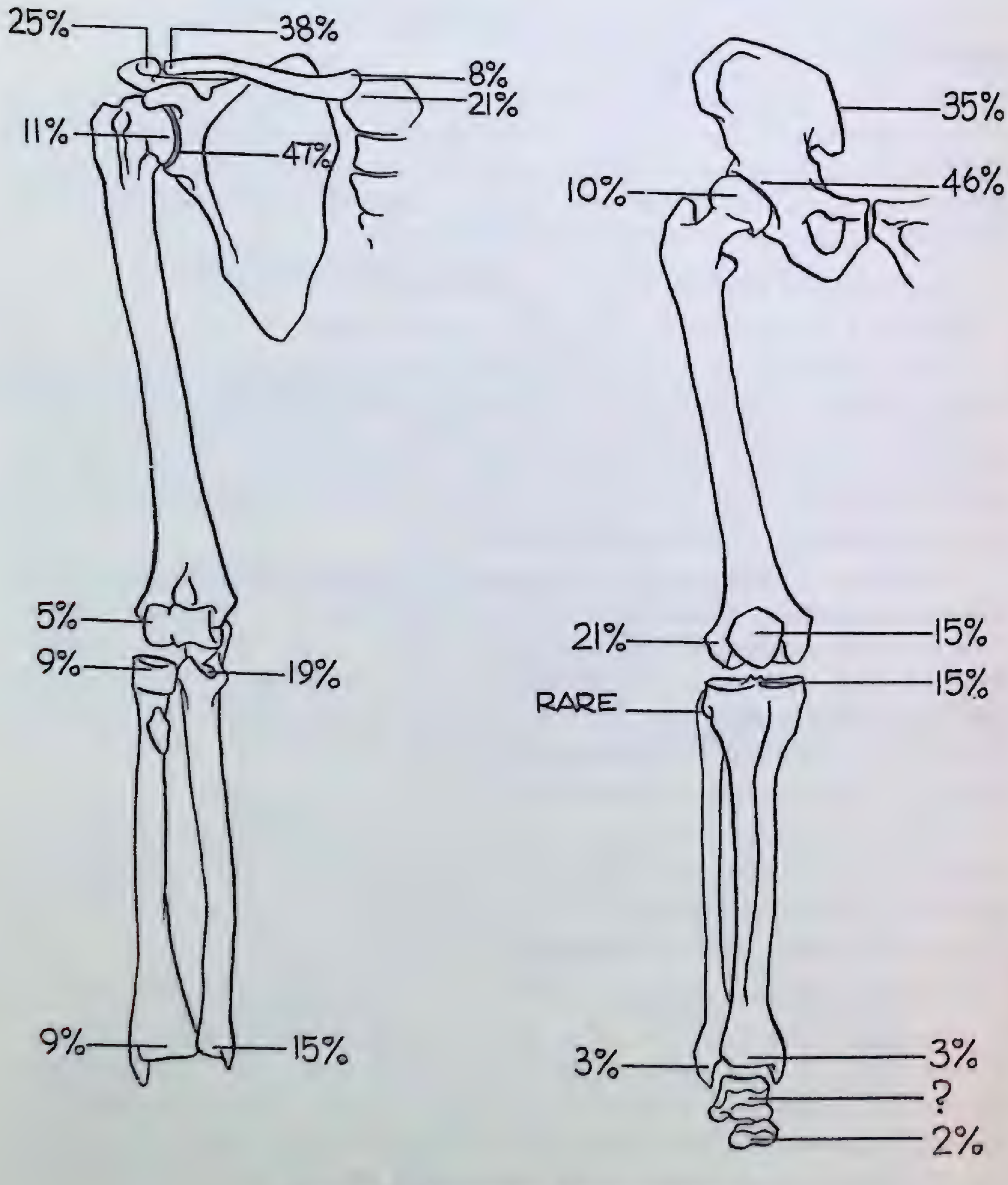


Figure 8. Distribution of osteoarthritis

5. *Degenerative changes begin in early adult life.*

The Fairty population was a comparatively young one, and still the incidence of osteoarthritis and osteophytosis was high.

VIII. DISCUSSION

In retrospect, the Fairty project has been a long and tedious one. The quantity of material never looked larger than it does now in the notebooks of data, the files of analysed statistics, and the dozens of drawers of catalogued bones temporarily at peace.

Apart from the morphological and pathological description of this population, many interesting osteological ideas and questions have appeared as by-products of the project. Most of these are beyond the scope of the present report, but some are worthy of mention here.

The search for variation has recovered from their anatomical limbo many skeletal anomalies that are apparently genetically determined and should be added to those routinely studied in a site report. Falling into this category are such variations as the level of the sacral hiatus, the form of calcaneal and atlas facets, the shape of the posterior surface of the navicular, and the presence of an arch over the mylohyoid groove. Comparative data on the dozens of variations studied are meagre, but in time the gaps will fill.

Variations such as glenoid extensions and acetabular notching are of unknown significance. Their inclusion in this report, like casting bread on the waters, may yield answers derived from the study of other populations.

Detailed observation of an anomaly may result in its subclassification. These varieties may have different etiologies. Canals for the vertebral artery on the atlas may take three quite different forms. A carotico-clinoid canal may or may not be associated with bridging between the anterior and posterior clinoid processes.

Many regions of the skeleton have not yet been studied carefully: variations in the metacarpal and metatarsal facets may be significant; the ribs almost cry out for attention. Almost certainly the "squatting facets" of the talus are poorly named. They are well marked in the foetus, who squats not at all. Examination of immature tali suggests that these joint extensions represent an arrested stage in the development of the upper surface of the talus.

The anterior region of the neck of the femur presents a number of striking variations: the irregular patch of cancellous bone that resembles osteoporosis, the oval area surrounded by a rim of compact bone that resembles an ulcer, and the Fossa of Allen that appears to be a pressure facet. Seen individually, they present as many different aspects as the fabled elephant did to the blind men; seen together in an age sequence they represent successive phases in the remodelling of the proximal end of the femur.

The wealth of immature bones from this site provides material for further study of the growth and development of the normal skeleton.

Many clinical questions arise from the observations that have been made: What is the effect on the vertebral artery and its plexus of sympathetic nerves when the foramen transversarium is narrowed? What is the relationship between calcaneal facet variation and the arches of the foot? What factors are involved in the production of the characteristic arthritic changes at a specific joint, and why do the two bones taking part in the same joint show different degrees of involvement?

Perhaps related to degenerations are the tiny bony spurs that appear as ossifications into fibrous tissue in certain areas: on the vertebral laminae, on the anterior surface of the patella, on the upper surface of the calcaneal tuberosity, and in the trochanteric fossa of the femur. Their possible relationship to ageing, exercise, and osteoarthritis or osteophytosis is yet to be determined.

As it is with most anthropological reports, two questions beset the author: Where does he start? When does he stop? This is where the report on the Fairty people stops, not because it is complete and not because the writer is weary, but because it has reached its limited goal. This goal has been the quantitative description of variation and pathology in the skeletons of one Iroquois population. Rather than being the end of a project, the completion of this report is really the beginning of a larger task: the comparison of the Fairty data with those of other Iroquois sites separated from it both geographically and temporally. Unfortunately, there is at the moment a dearth of published observations of Iroquois morphology and pathology. When such information becomes available, comparisons may explain much concerning the genetic basis of morphological variation, the patterns of disease, and the relationships of the earlier inhabitants of Ontario.

RÉSUMÉ

Les fouilles effectuées jusqu'ici à l'ossuaire iroquois de Fairty ont rendu les ossements de 512 individus dont 144 étaient d'âge prépubère, 73, des adolescents et 295, des adultes. Les deux sexes y étaient représentés en proportion à peu près égale. La taille des squelettes varie de 5 pieds 1 pouce à 5 pieds 11 pouces, soit 5 pieds 7 pouces en moyenne.

Les crânes ont tendance à être mésocéphales, la face étant plutôt allongée, l'orifice nasal, large et les orbites, basses et arrondies. La voûte est ovale et prolongée par un occiput protubérant. Les bourrelets sus-orbitaires forment un V continu et le menton est ordinairement de forme médio-bilatérale. Les mensurations et les indices céphaliques sont tout à fait semblables à ceux des ossements de l'ossuaire de Tabor Hill. La figure nº 9 illustre de façon sommaire quelques-unes des caractéristiques et variations morphologiques du crâne. Nombreux sont les cas de déhiscence de la paroi de la caisse du tympan et d'anomalies de l'apophyse carotico-clinoïde, de présence d'un os interpariétal, de rainures du digastrique et d'un arc

mylohyoïde. On trouve peu de cas de suture métopique, d'exostose du conduit auditif, d'apophyse jugulaire, de trous ptérigoïdes et de *torus mandibularis* ou *palatinus*.

La figure nº 10 illustre de façon sommaire quelques-unes des caractéristiques de la partie sous-crânienne du squelette. A remarquer les anomalies vertébrales, l'aplatissement de la diaphyse du fémur et du tibia, les «facettes écrasées», les extensions glénoïdes et les échancrures du cotyloïde. Il se trouve un grand nombre d'ouvertures septales, de trous sternaux et de rotules bipartites, mais très peu de trous sus-scapulaires, de troisièmes trochanters et d'apophyses sus-trocléennes.

L'ostéoarthrite et l'ostéophyte sont communes; leur présence et leur situation typique aux diverses articulations ont fait l'objet d'analyses. Il y a des marques de trauma, tout particulièrement des fractures par compression des vertèbres. Les vestiges d'infections osseuses indiquent la présence de périostite, d'ostéomyélite et d'abcès. La dentition est caractérisée par des caries, la perte de dents antérieure à la mort et l'infection des tissus alvéolaires.

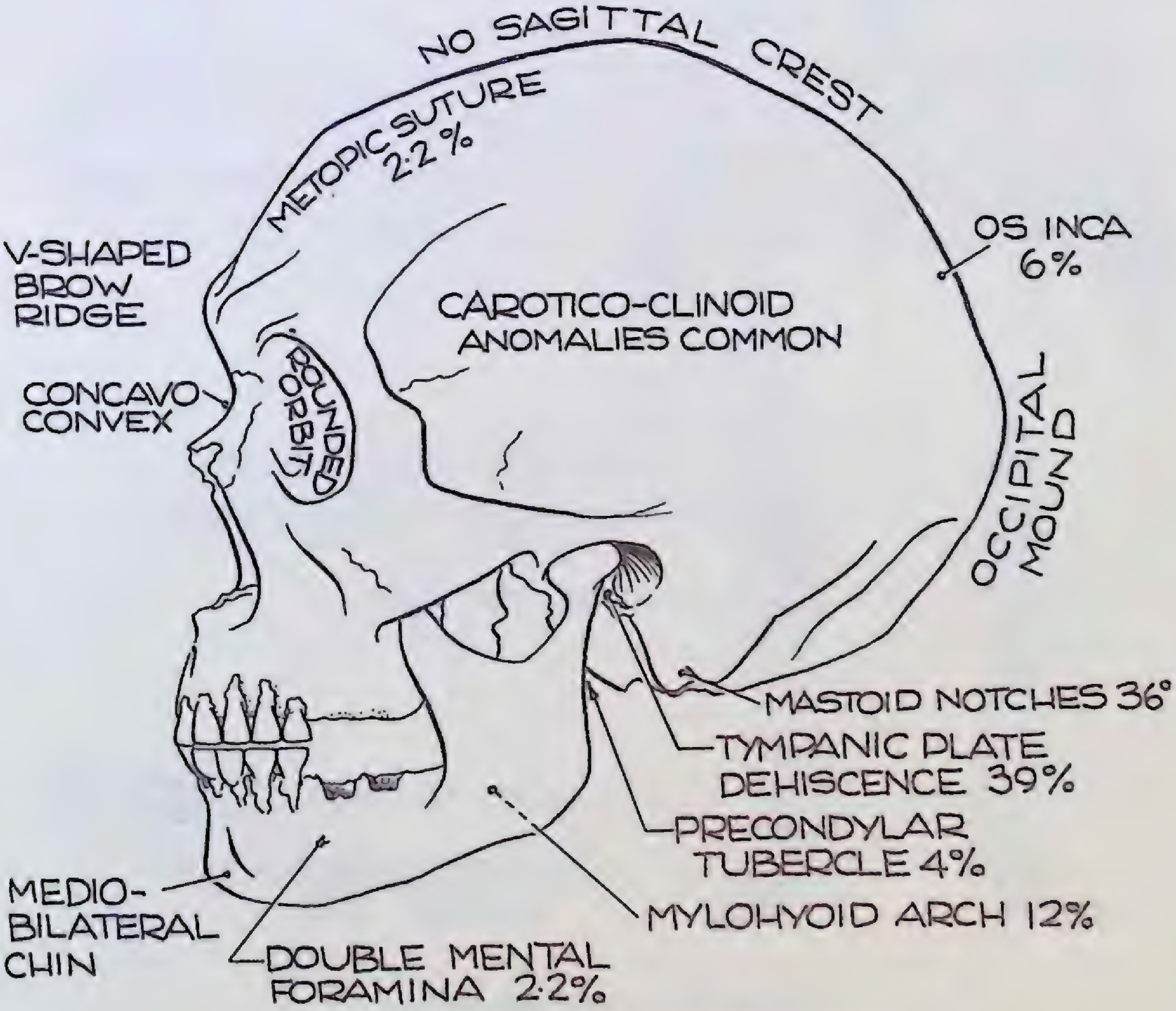


FIGURE 9. Summary of cranial characteristics

Pour obtenir des données comparatives pertinentes, une nouvelle analyse ostéologique de matières connexes s'impose.

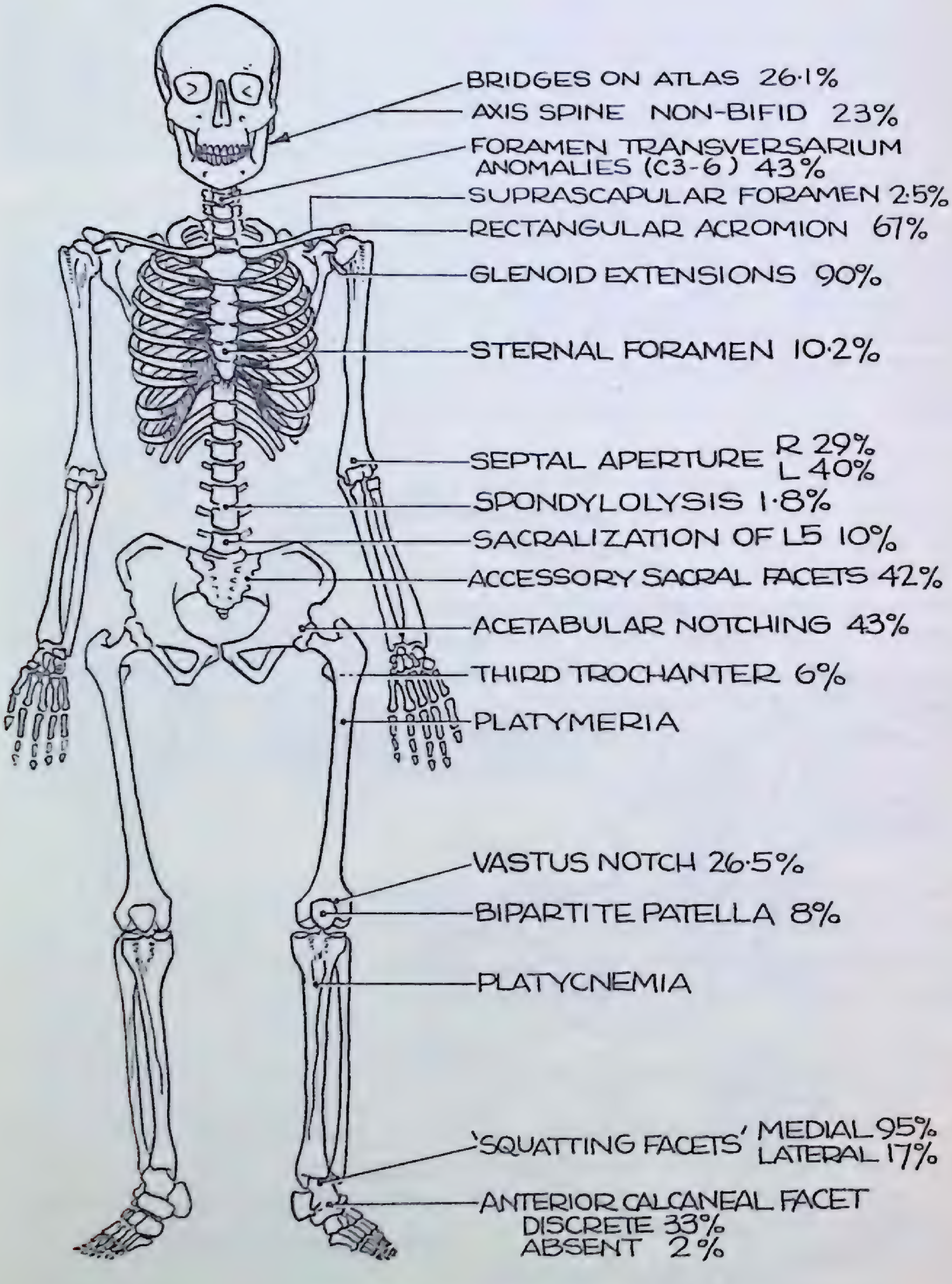


FIGURE 10. Infracranial variation

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PLATE I

Norma Frontalis and Lateralis of Skull 24 with associated mandible (Measurements in mm):

Cranial length	190	Nasal height	54
Cranial breadth	137	Nasal breadth	28
Basion-bregma	147	Nasal index	51.9
Cranial module	158	Orbital height	34
Cranial index	72.1	Orbital breadth	44
Auricular height	124	Orbital index	77.3
Min. frontal breadth	100	Alveolar breadth	68*
Height/length index	77.4	Alveolar length	61
Height/breadth index	93.2	Maxillo-alveolar index	115*
Bizygomatic diam.	142	Ramus breadth	38
Total facial height	128*	Ramus height	73
Facial index	89.5*	Bigonial breadth	96*
Upper face height	81	Height of symphysis	35
Upper facial index	57.0		

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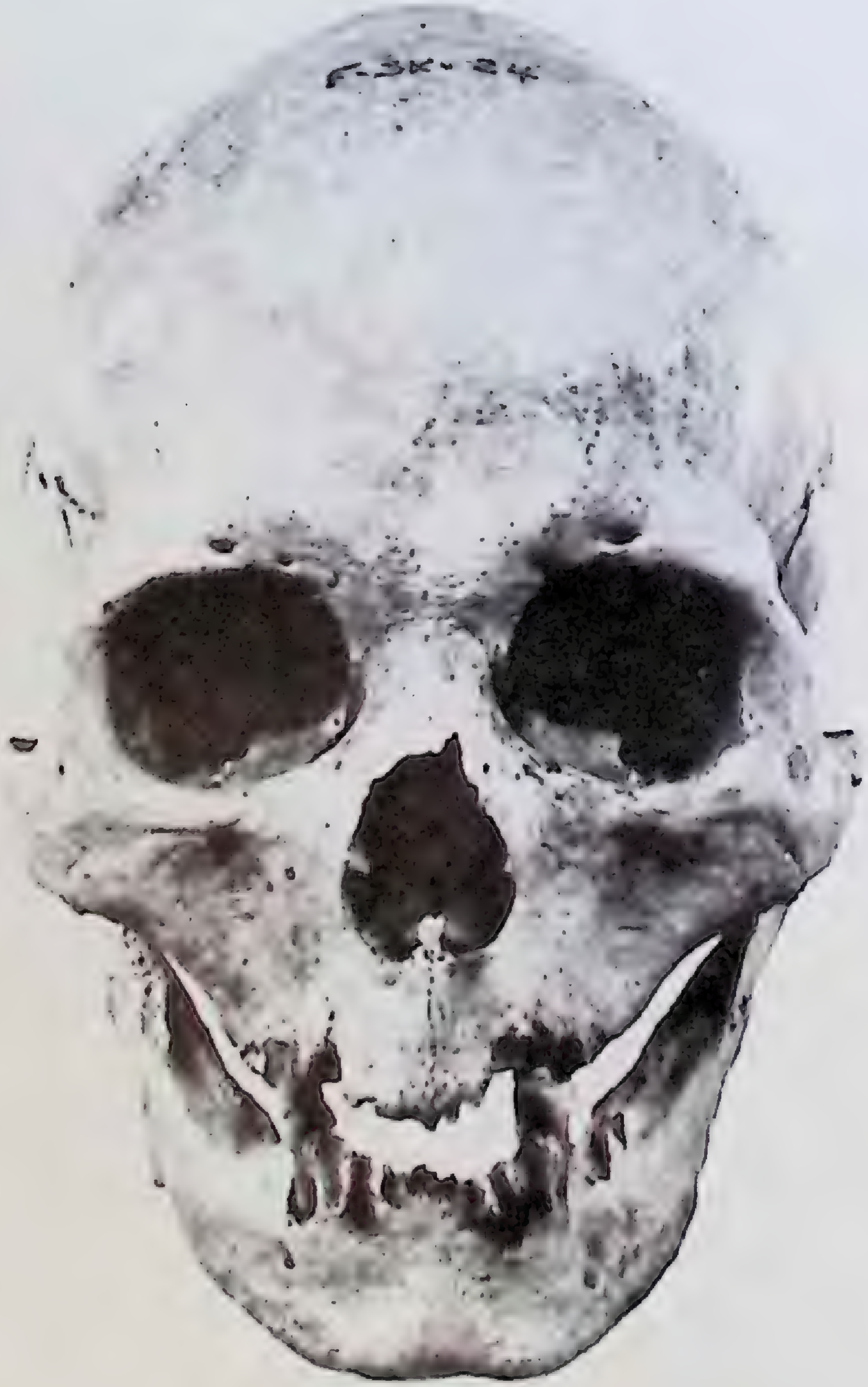
* Estimated

PLATE I



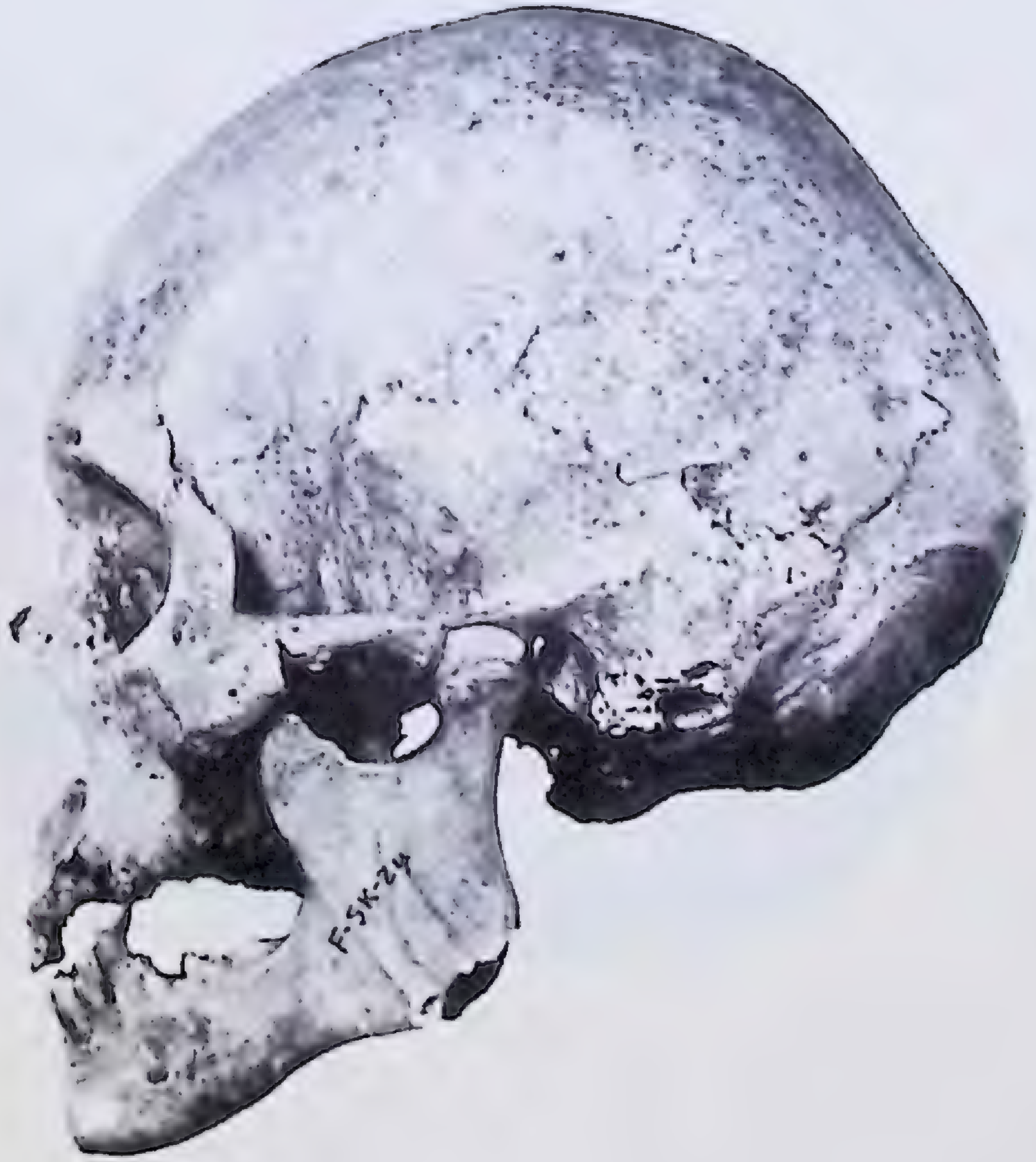


PLATE II

A. Norma verticalis of an adult skull with a persisting metopic suture.

B. Anterior view of a frontal bone showing double supraorbital foramina and multiple grooves in the bone above them for branches of the supraorbital vessels and nerve.

PLATE II

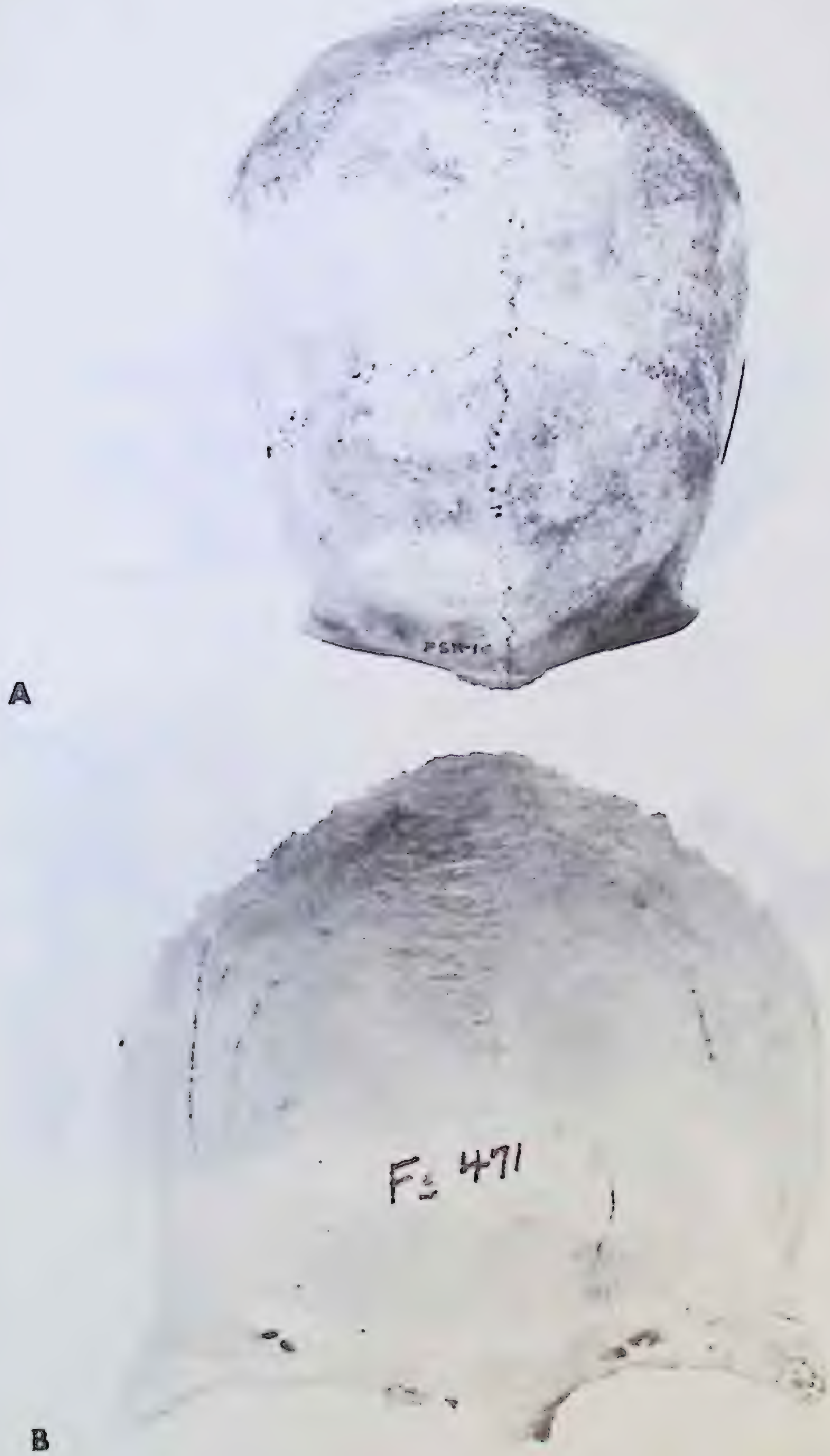


PLATE III

A. Norma lateralis of a skull which has a round, discrete, new growth of bone on the posterior part of the squamous temporal.

B. The left side of the base of a skull showing arthritic changes in the jaw joint. A plaque of new bone extends forward on the articular eminence, and tiny pitted areas of erosion are present.

C. A detailed view of the anterior part of the foramen magnum of a skull having a precondylar tubercle.

Plate III

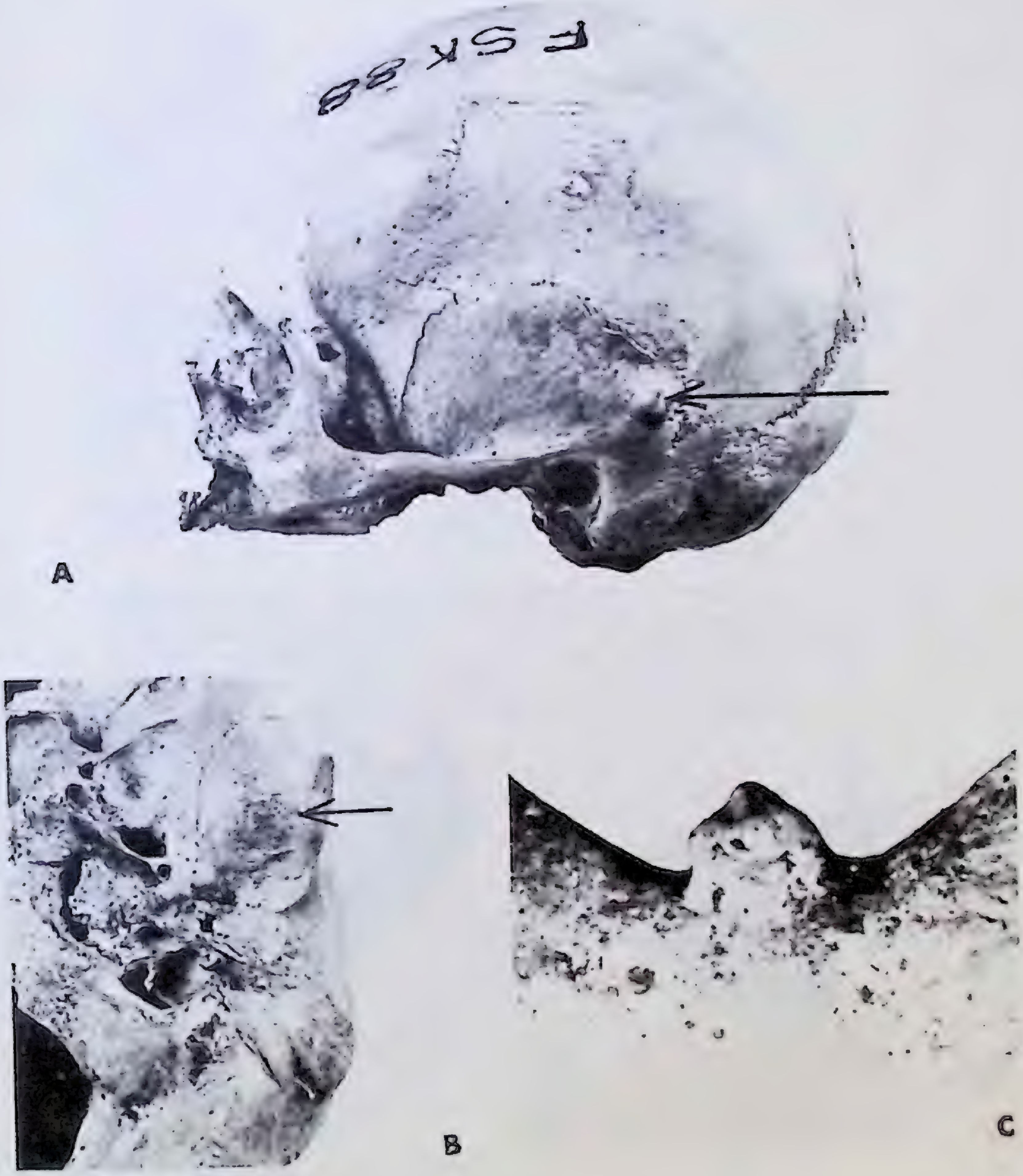


PLATE IV

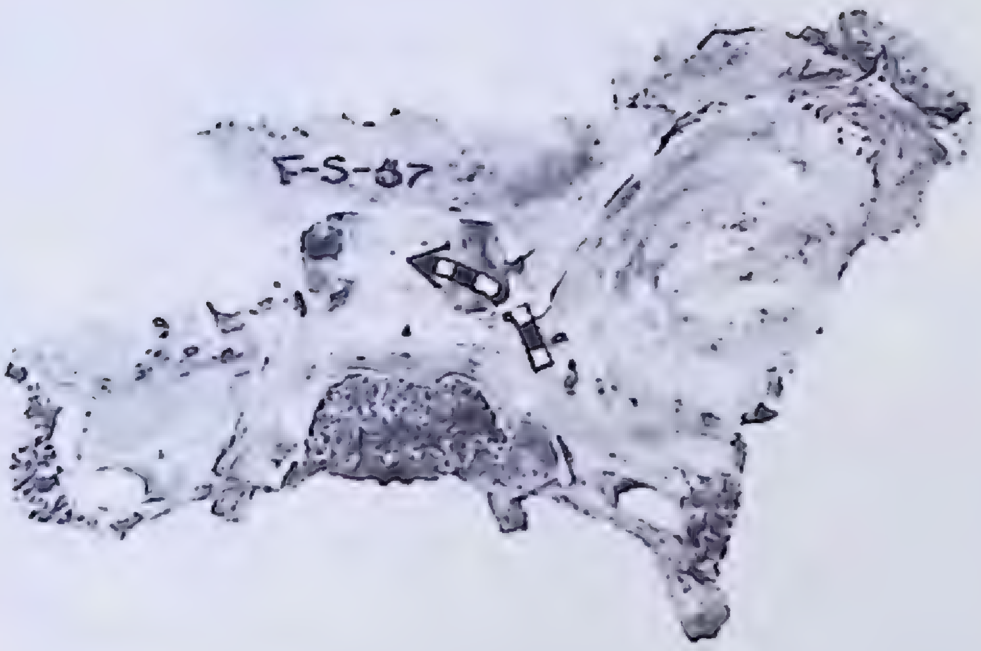
Three types of variation in bony bridges occurring in the region of clinoid processes of the sphenoid bone:

A. The anterior clinoid process is connected to the body of the sphenoid by a bar of bone, so forming a carotico-clinoid canal through which passes the internal carotid artery.

B. A bridge of bone connects anterior and posterior clinoid processes, but it has no contact with the body of the sphenoid.

C. A fragment of sphenoid bone with bony bridges connecting the anterior clinoid, body of the sphenoid, and the posterior clinoid. The bridges of bone form boundaries for two enclosed foramina, the anterior of which (marked by an arrow) transmits the internal carotid artery.

PLATE IV



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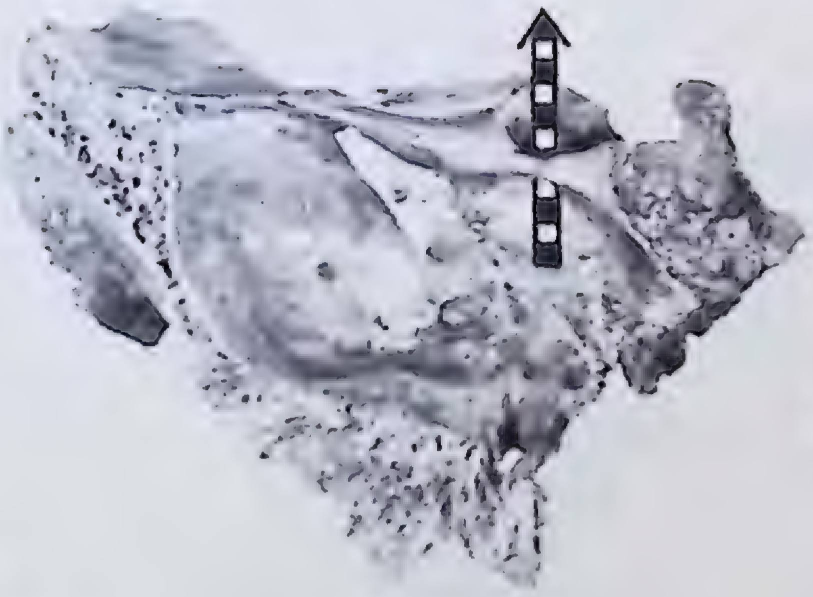

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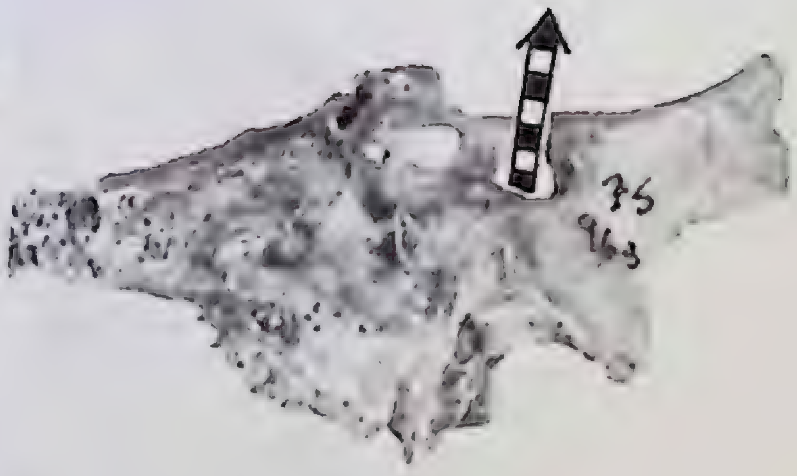

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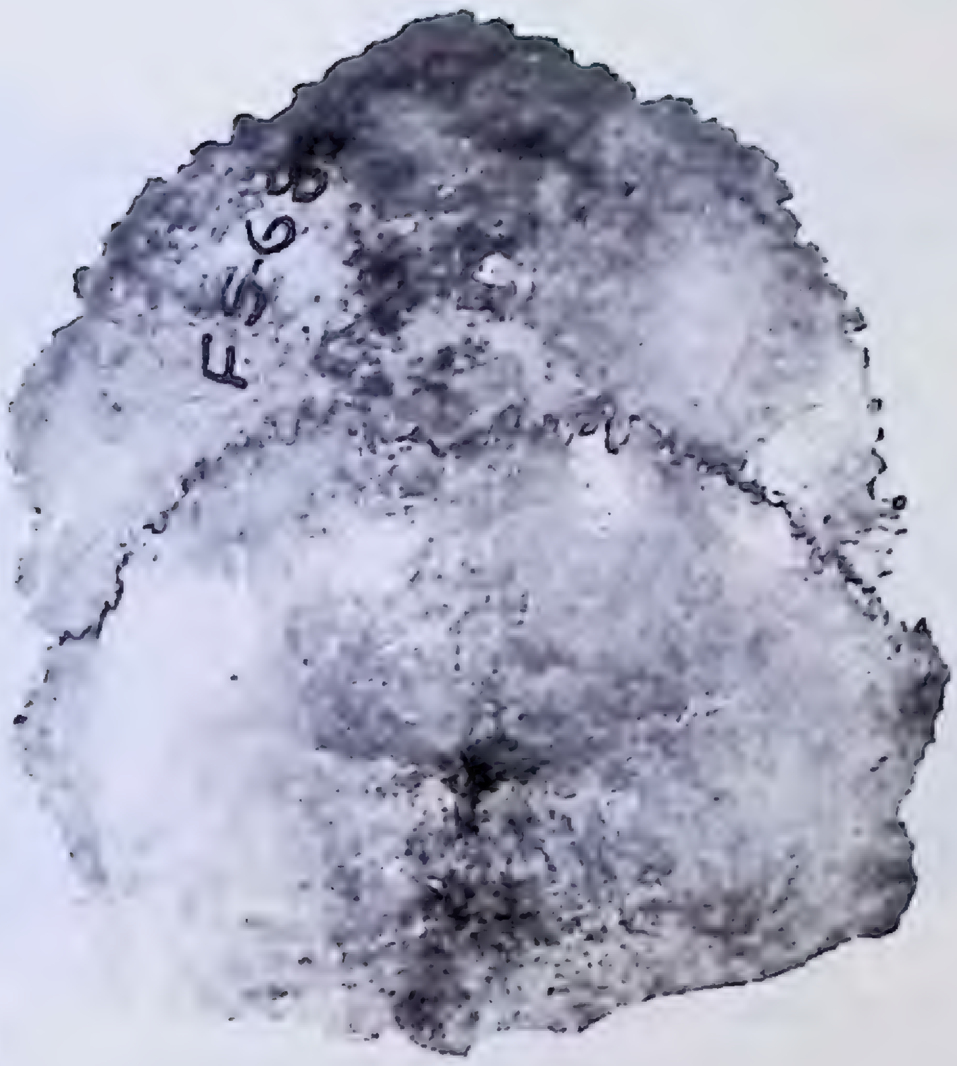
PLATE V

Two examples of *os inca* or interparietal bone, which is formed when the upper segment of the squamous part of the occipital bone fails to unite with the lower segment.

A. Posterior view of a young occipital bone with an unfused upper segment.

B. Norma occipitalis of an older skull with an os inca.

PLATE V



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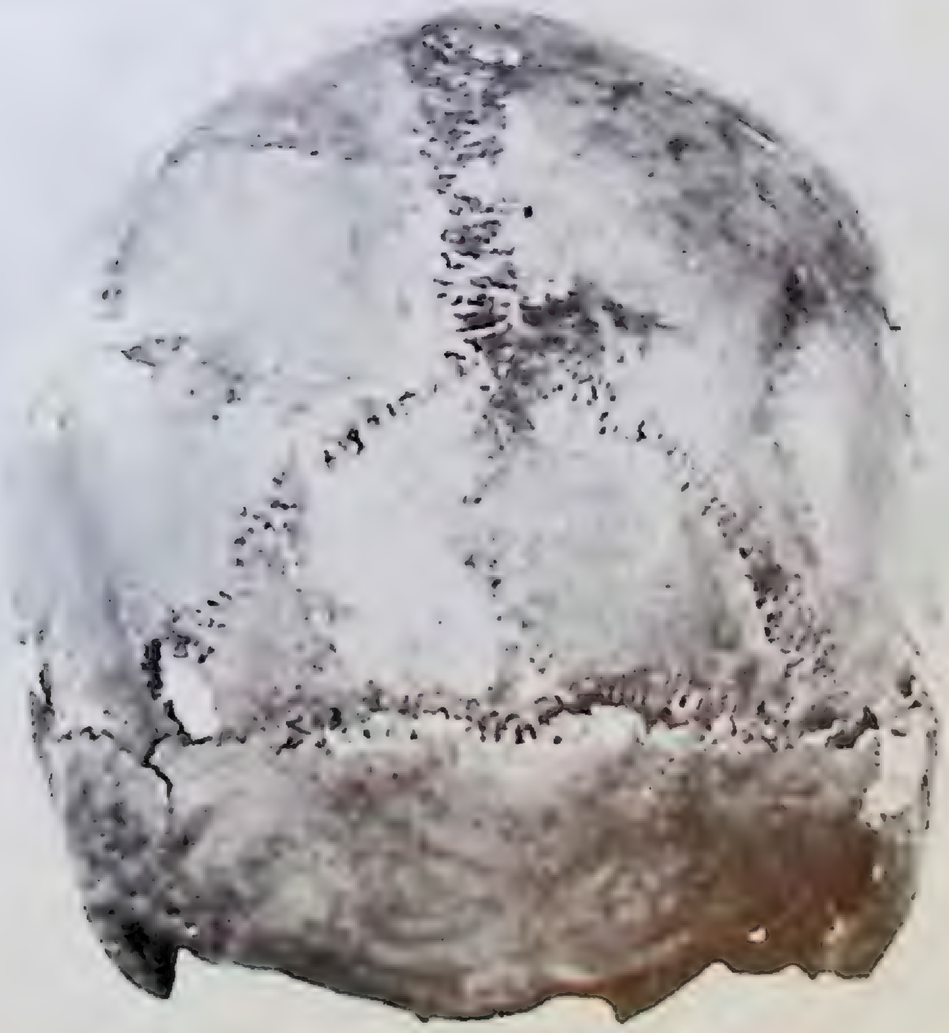

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Plate VI

A. Norma occipitalis of a skull having a large accessory bone at the site of the posterior fontanelle. Notice that the lambdoid suture is more distinct than the suture between the accessory bone and the occipital.

B. Norma occipitalis of a skull in which the lambdoid suture bulges anteriorly near the midline. In this older individual there is fusion of the inferior suture of an accessory bone which had formed from a centre of ossification in the posterior fontanelle.

C. A detailed view of the lambdoid region of a skull. Only slight traces remain of a suture which once existed between the occipital bone and an accessory bone formed in the posterior fontanelle. A wormian bone is also present in the left lambdoid suture.

Plate VI

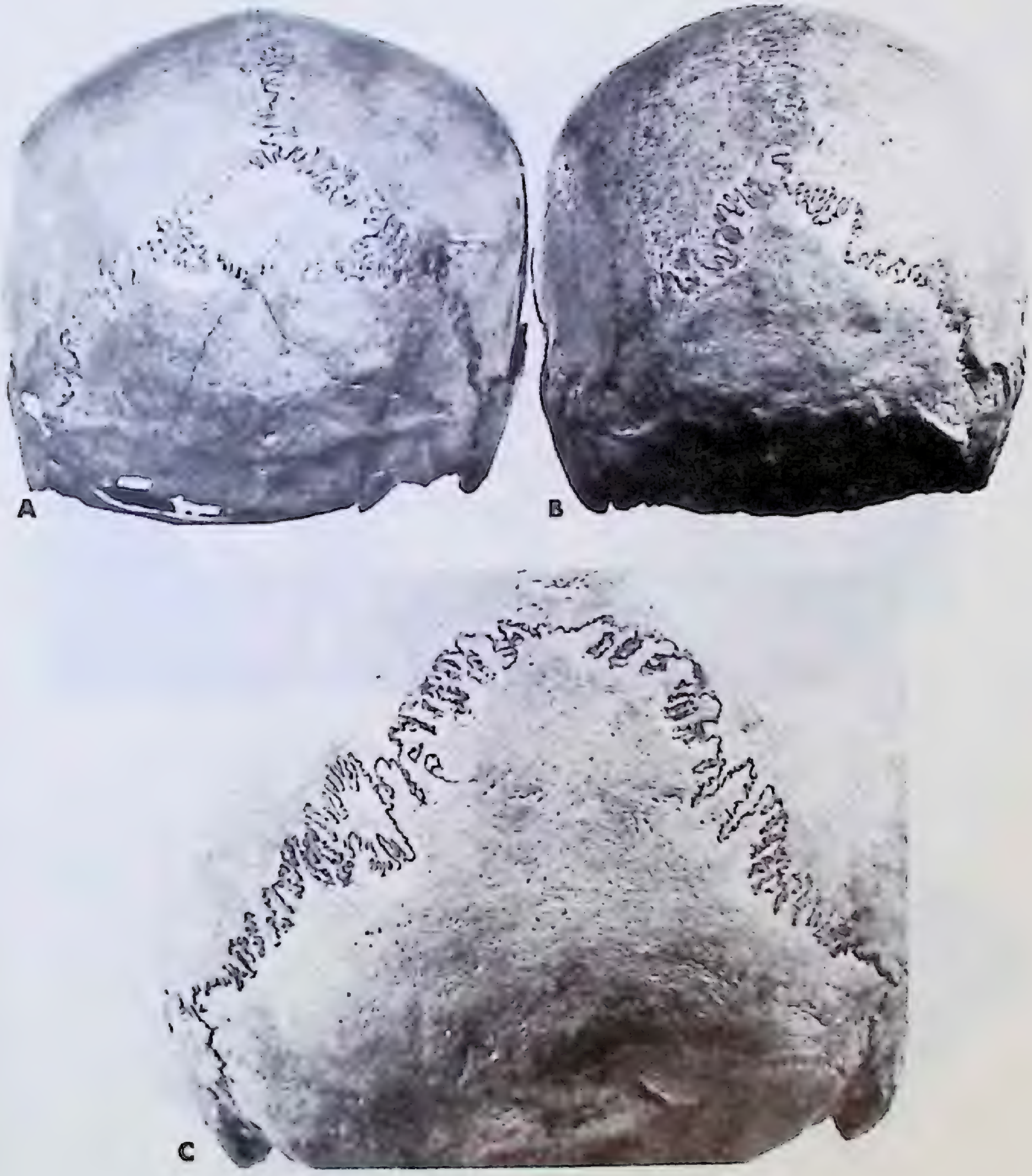


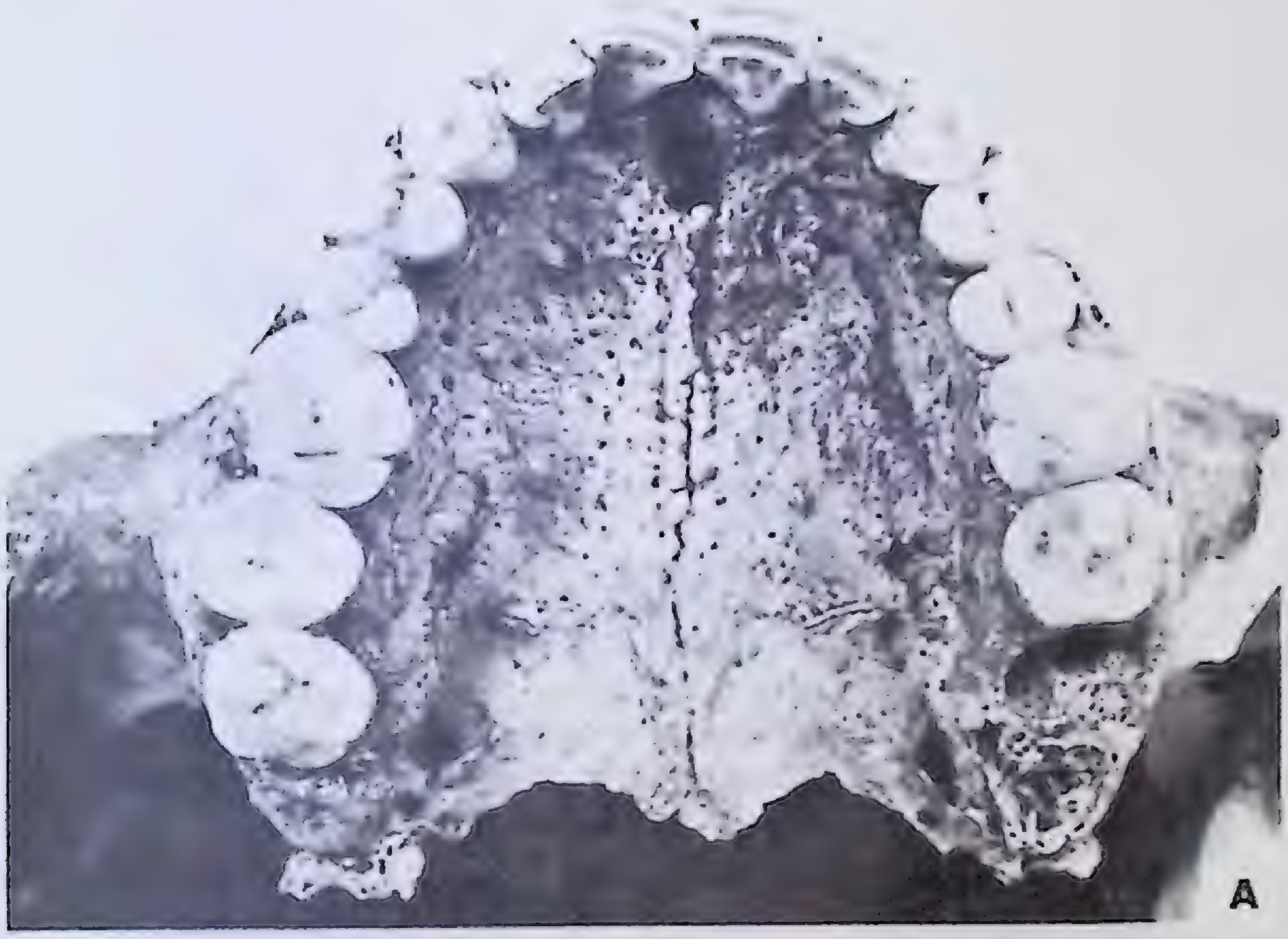
Plate VII

A. Occlusal view of the maxillary dentition of one specimen showing a smooth, rounded, dental arch with moderately advanced attrition resulting in an edge-to-edge bite. The degree of attrition, the symmetry of the dental arch, and the absence of caries are unusual in the skulls of this site.

B. An amorphous segment of mandible forming an osteomyelitic sequestrum.

C. A fragment of maxilla bearing a peg-shaped lateral incisor tooth.

PLATE VII



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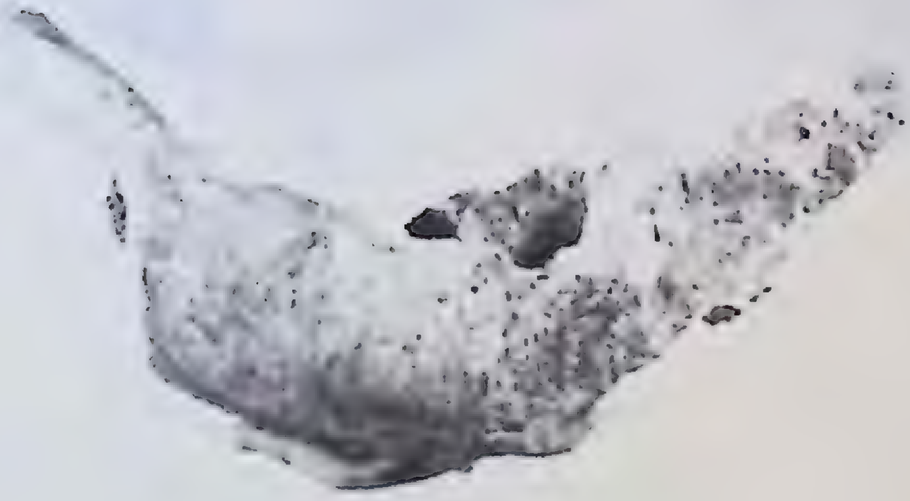

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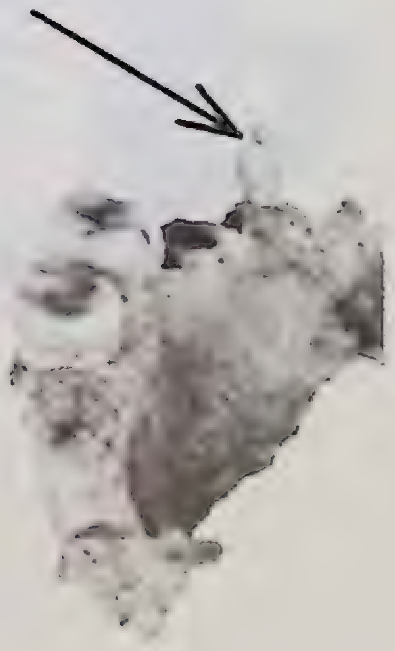

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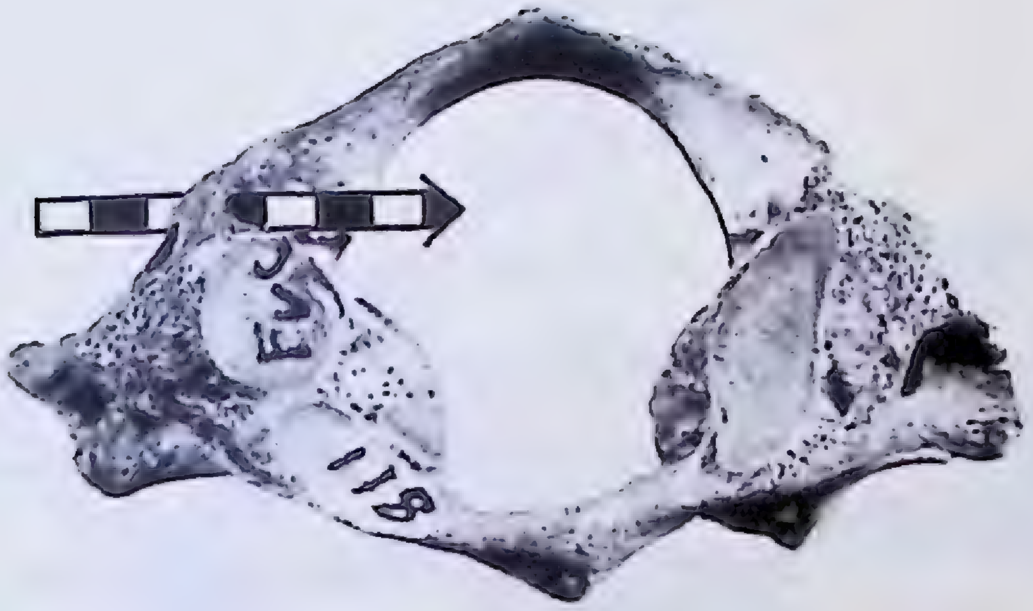
Plate VIII

A. In this superior view of an atlas vertebra, a bony bridge may be seen passing from the posterior arch to the superior articular process, forming a tunnel for the vertebral artery. On this specimen, the foramen transversarium is obscured by another bony process running to the superior articular process from the transverse element. The vertebral artery is thus within a bony canal from the time it enters the atlas until it reaches the foramen magnum to enter the base of the skull. The superior articular facets are asymmetrical, single on the left and double on the right.

B. Two defects of ossification are present on this atlas: the left costal bar has failed to form, and the anterior arch is unfused in the midline.

C. On the left side of this atlas, a spur of bone projects from the posterior arch surrounding the area for the vertebral artery, but failing to meet the superior articular facet.

PLATE VIII



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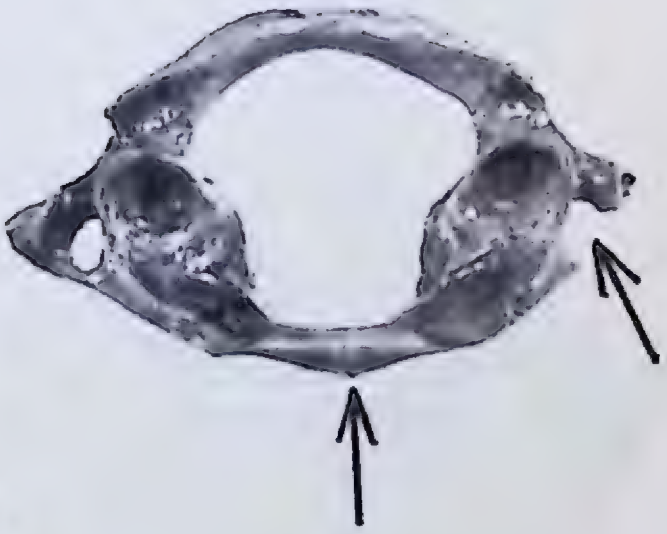

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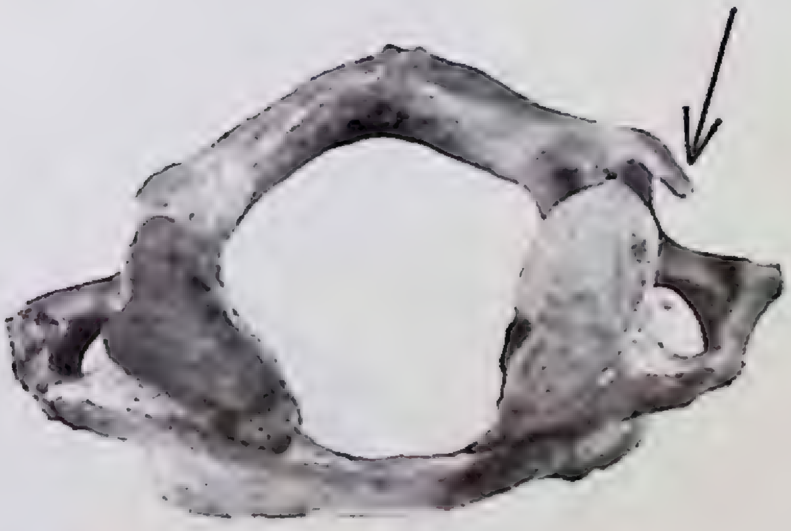

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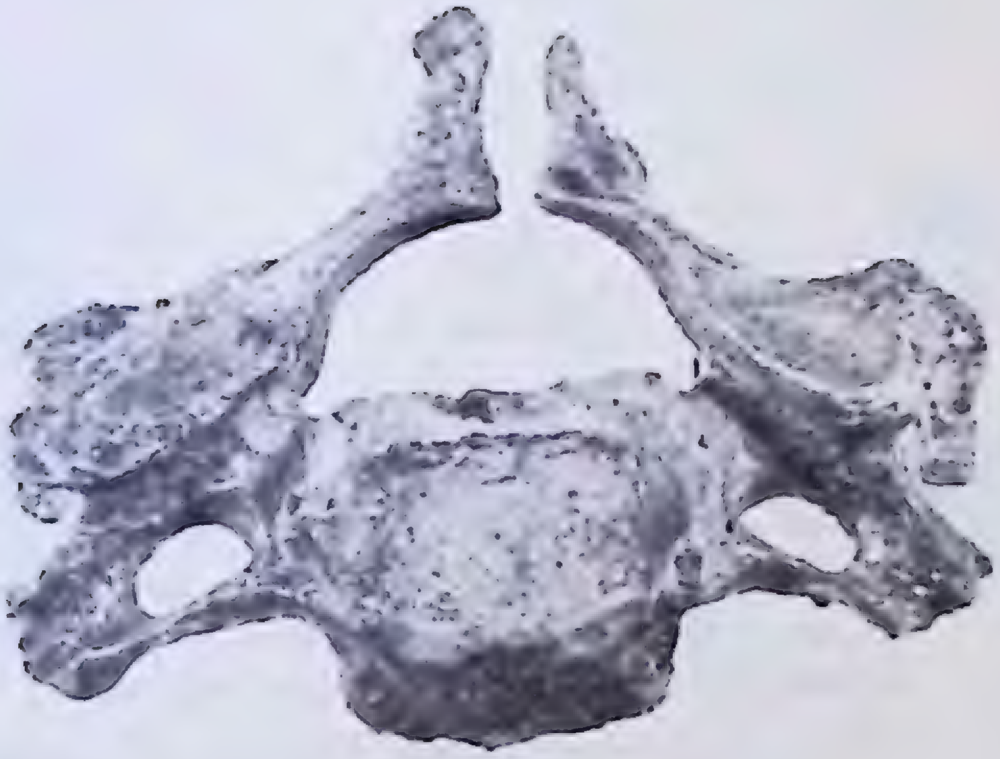
Plate IX

Two examples of spina bifida are illustrated:

A. The right and left halves of the neural arch of a cervical vertebra have failed to fuse.

B. In addition to spina bifida, this atlas has an unusual enlargement of the left neural arch.

PLATE IX



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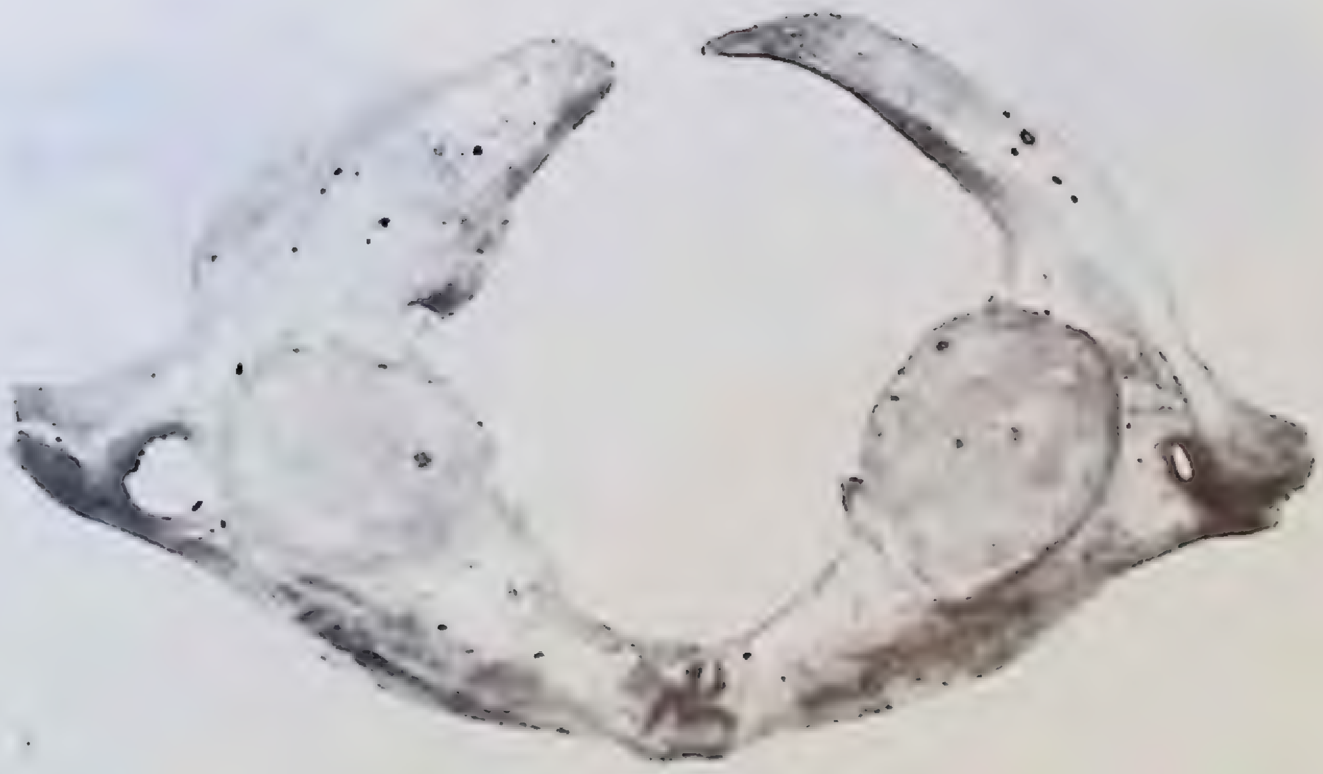

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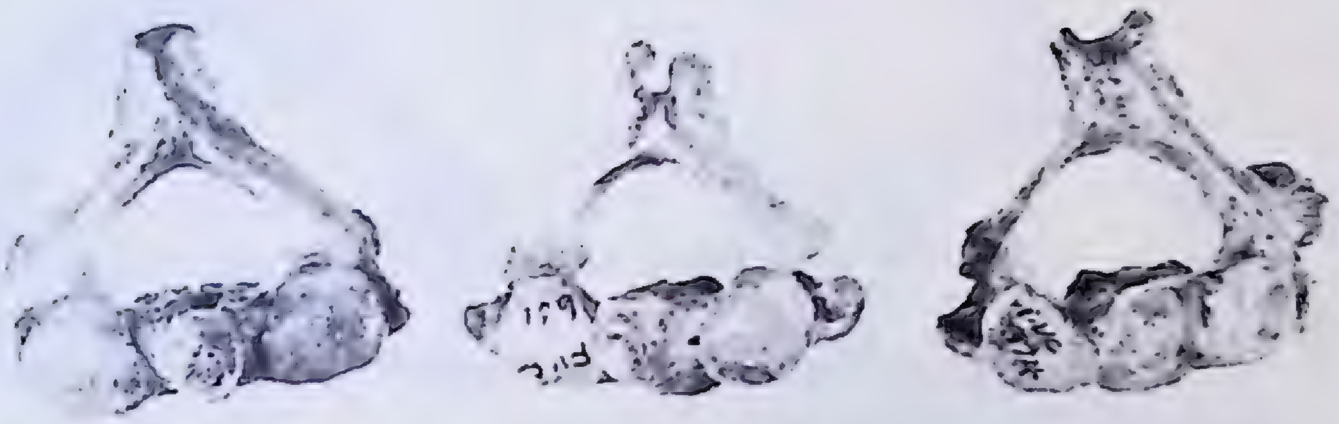
Plate X

A. Three varieties of spinous process on the axis vertebra are shown: single, bifid with projections parallel to each other, and bifid with divergent tips.

B. In this posterior view of an axis vertebra, a fan-shaped process of bone extends upwards from the apex of the dens, representing ossification of the apical ligament.

C. This superior view of the right fragment of an atlas vertebra shows an extensive facet on the transverse process for articulation with a paramastoid process on the base of the skull.

PLATE X



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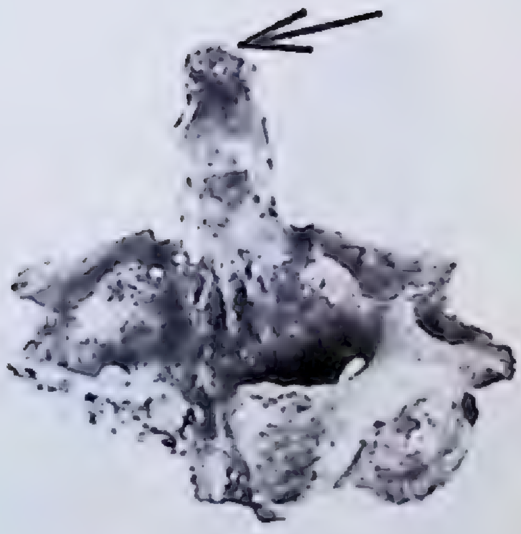

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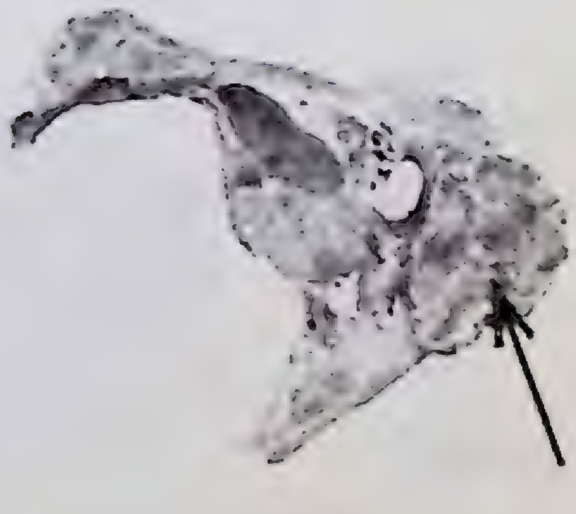

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Plate XI

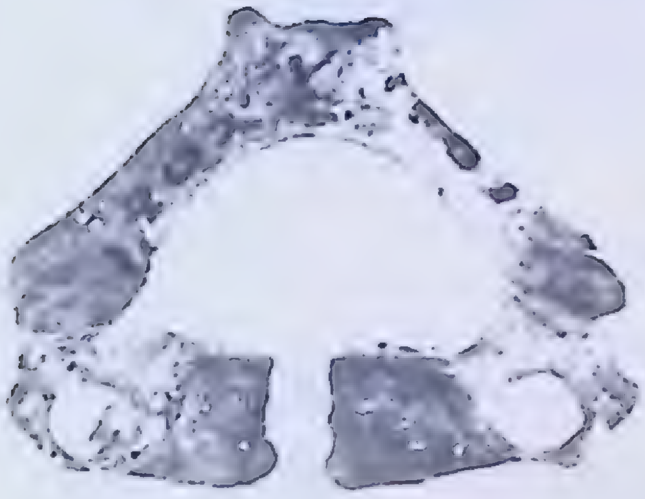
A. A young cervical vertebra showing a large defect in the centrum.

B. In this cervical vertebra the foramen transversarium on each side is double.

C. This oblique view of a thoracic vertebra shows a compression fracture of the vertebral body.

D. Marked osteophytosis and ossification of the anterior longitudinal ligament on a lumbar vertebral body.

Plate XI



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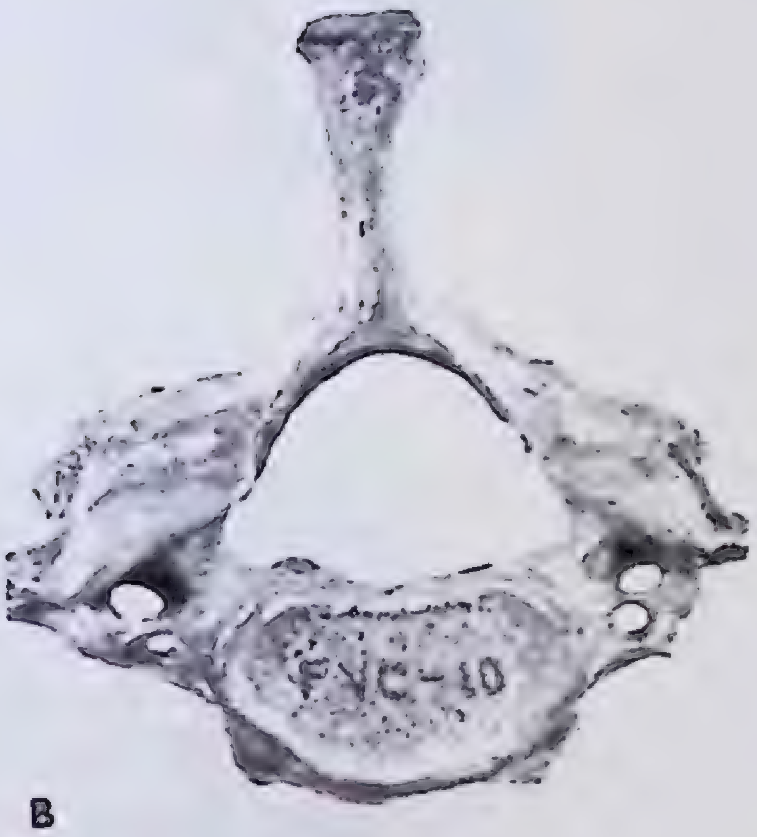

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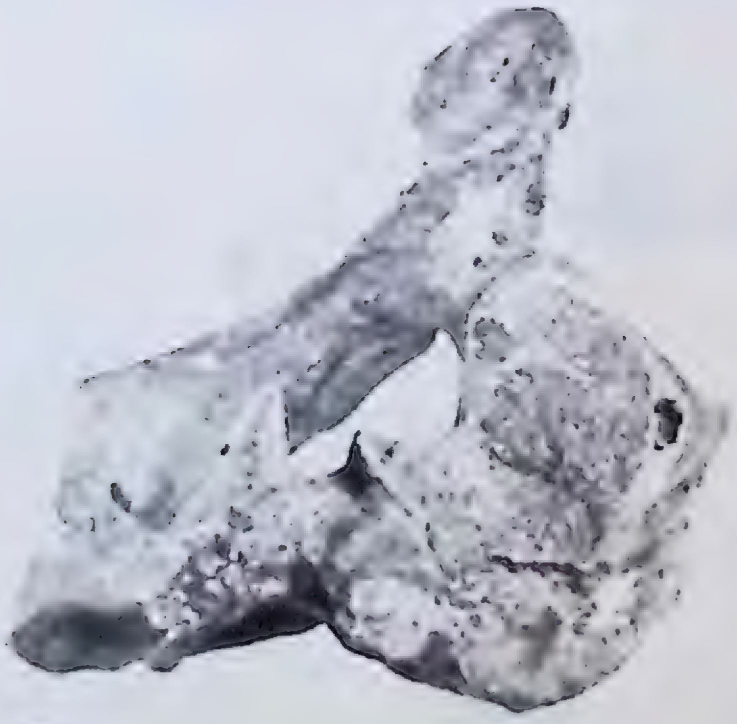

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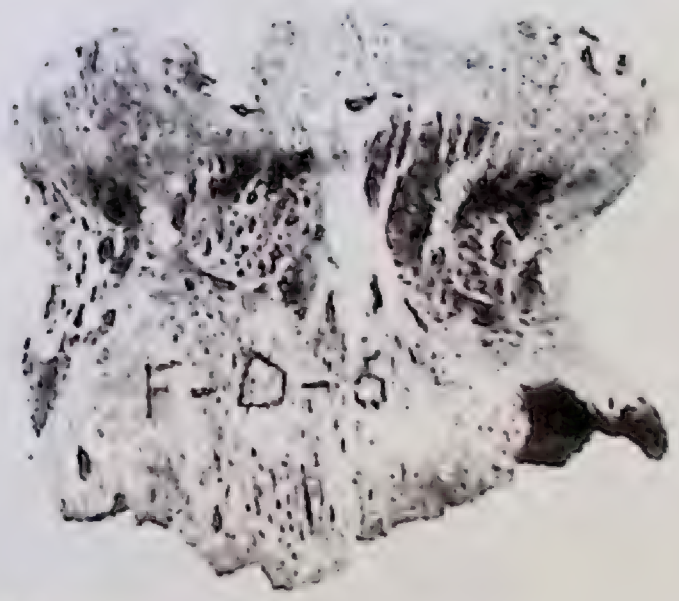


D

Plate XII

A. A view of an atlas vertebra from behind showing extensive peripheral lipping of the articular facet for the dens.

B. A side view of a second and third cervical vertebra which are fused together at their bodies and at their apophyseal joints. Notice also that the dens is pitted and distorted due to arthritic changes at its joint with the atlas.

C. The inferior surface of a cervical vertebra showing degenerative changes of the body and of the left articular facet. In these areas, the bone is pitted centrally, and irregular lipping is shown to extend peripherally to encroach upon the vertebral canal and overlap the foramen transversarium.

PLATE XII

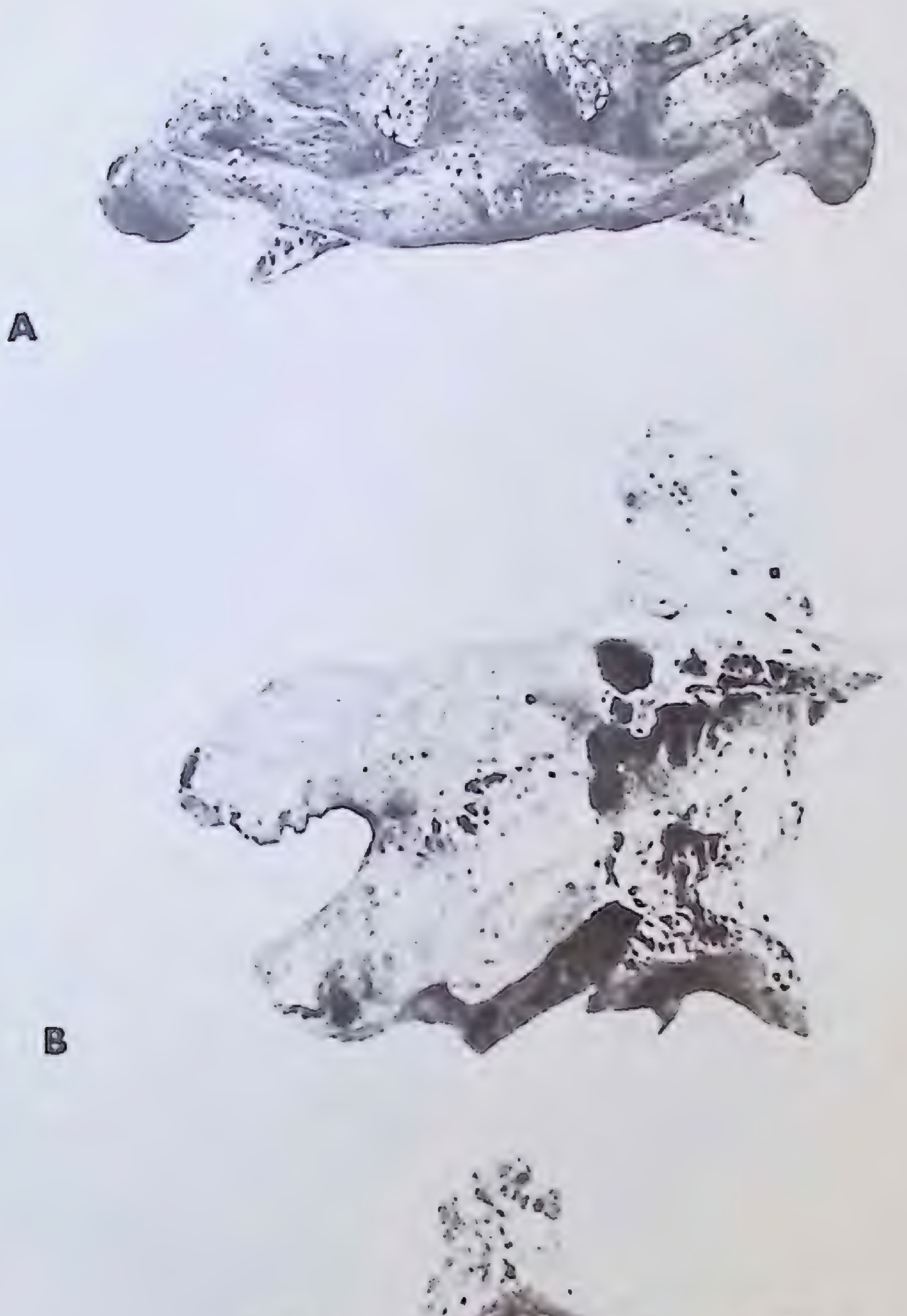


Plate XIII

A. A left cervical rib fused to the seventh cervical vertebra.

B. The body of a lumbar vertebra with smooth-walled cavities eroding its interior. Bacterial infection has produced marked destruction and abscess formation in the vertebral body. The causative organism is not known, but tuberculosis cannot be ruled out.

Plate XIII

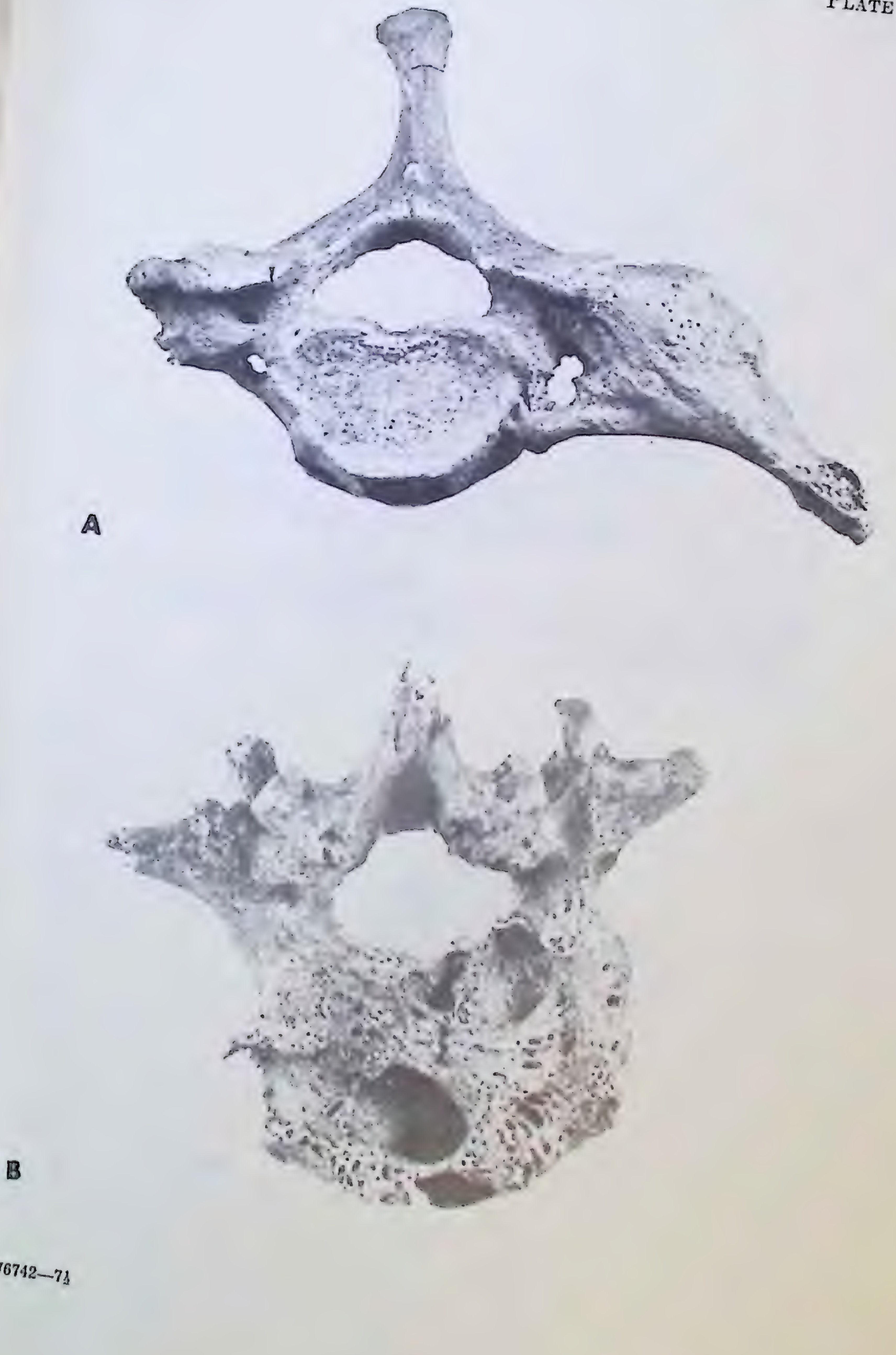


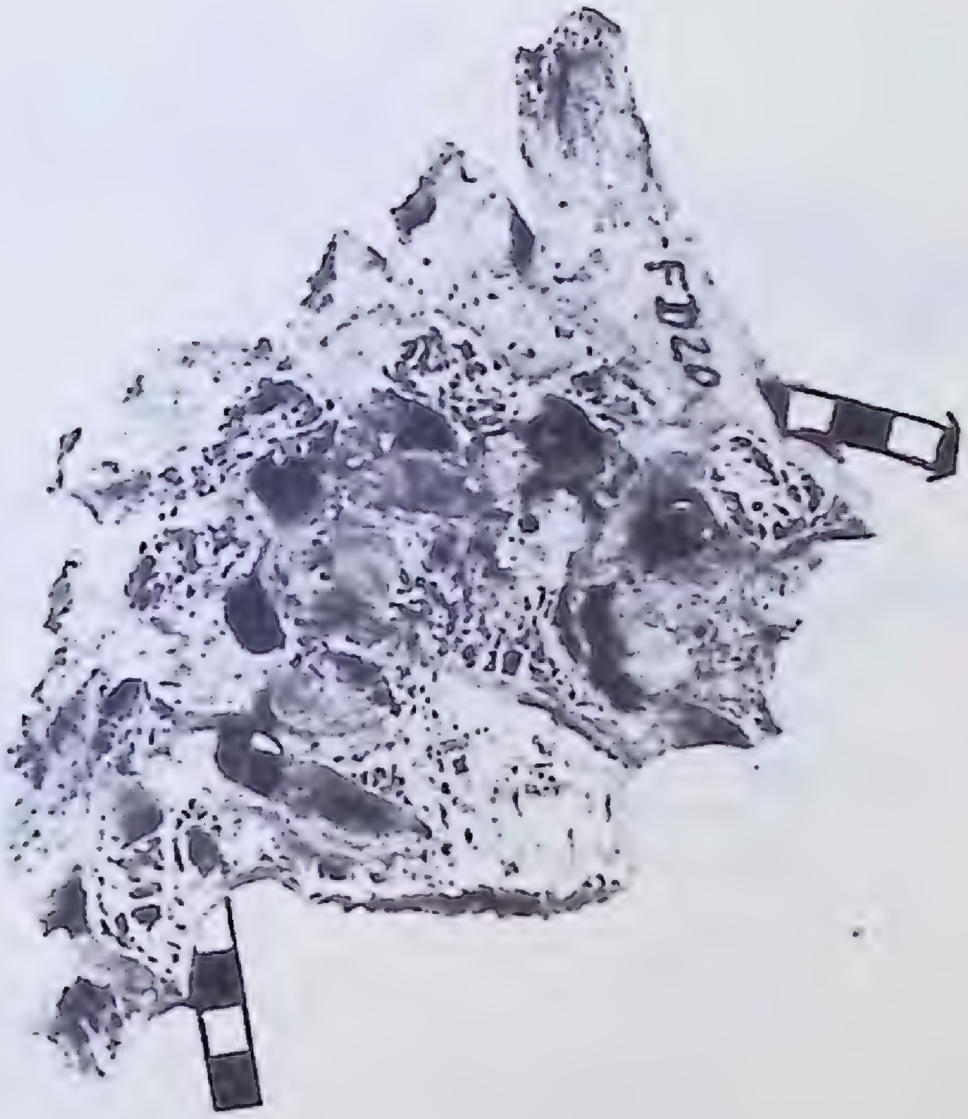
PLATE XIV

Two cases of massive infection in the vertebral region. Destruction of the vertebral bodies had led to their collapse and subsequent fusion to each other as healing progressed. The result is a marked regional kyphosis.

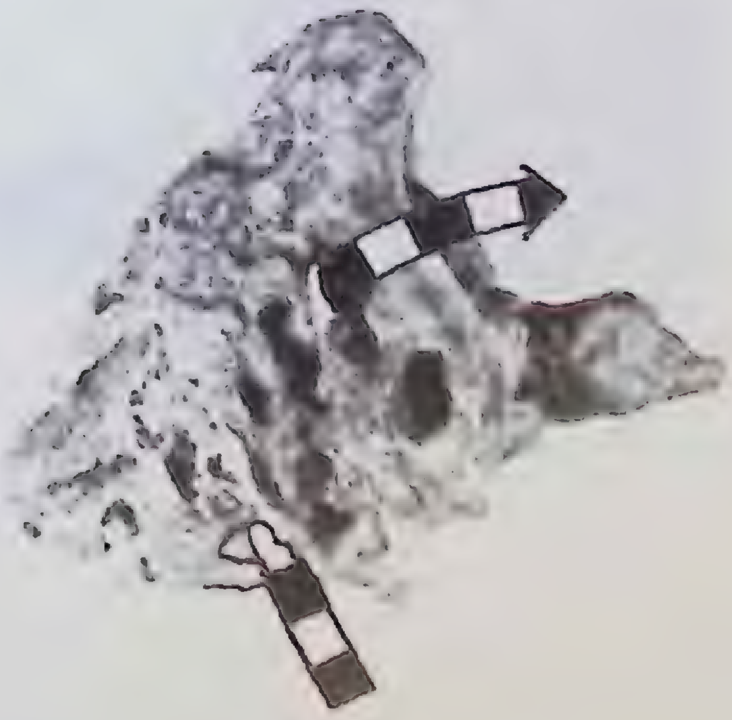
In *A*, seven thoracic vertebrae are involved. As may be seen, the canal for the spinal cord makes a 90-degree change in direction throughout its course in this area. Surprisingly enough, there is no encroachment on the spinal canal, but there is some narrowing of the foramina for the spinal nerves.

The specimen illustrated in *B* consists of cervical vertebrae 2 to 7. Foramina for the spinal nerves are partially occluded, as is the passageway for the vertebral artery.

PLATE XIV



A



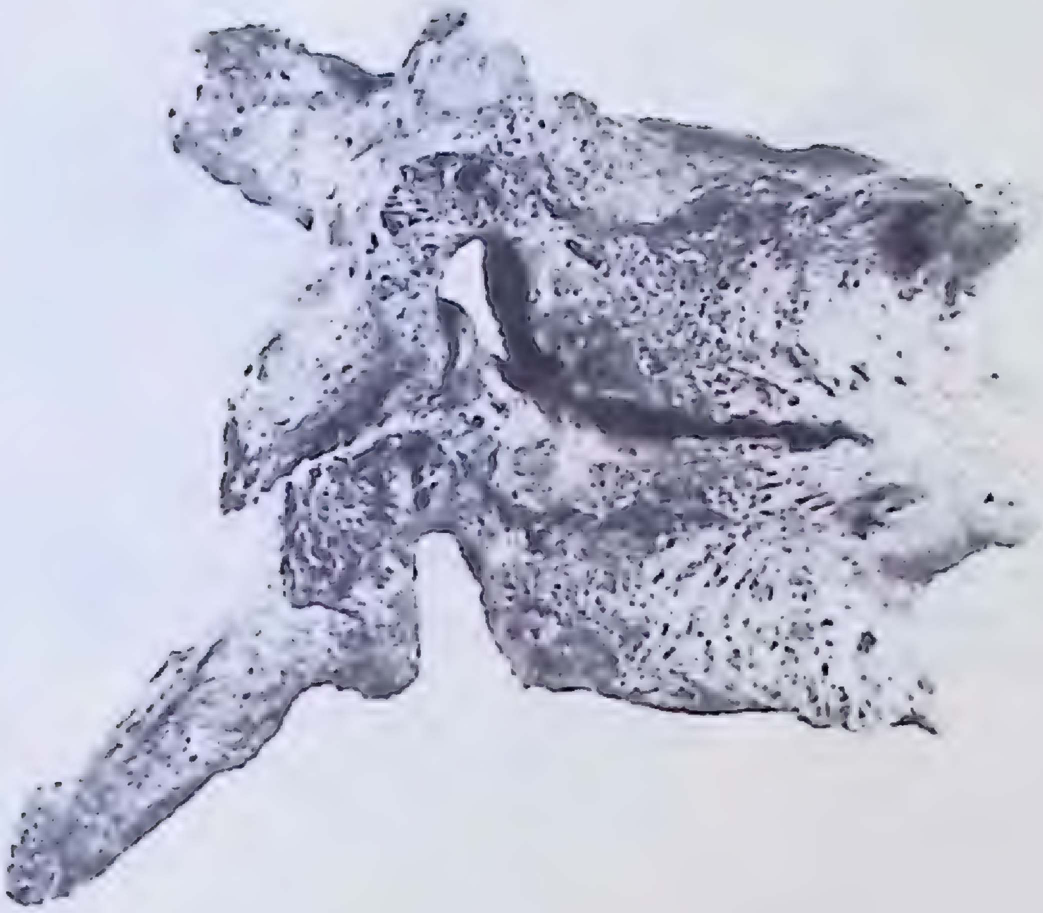
B

PLATE XV

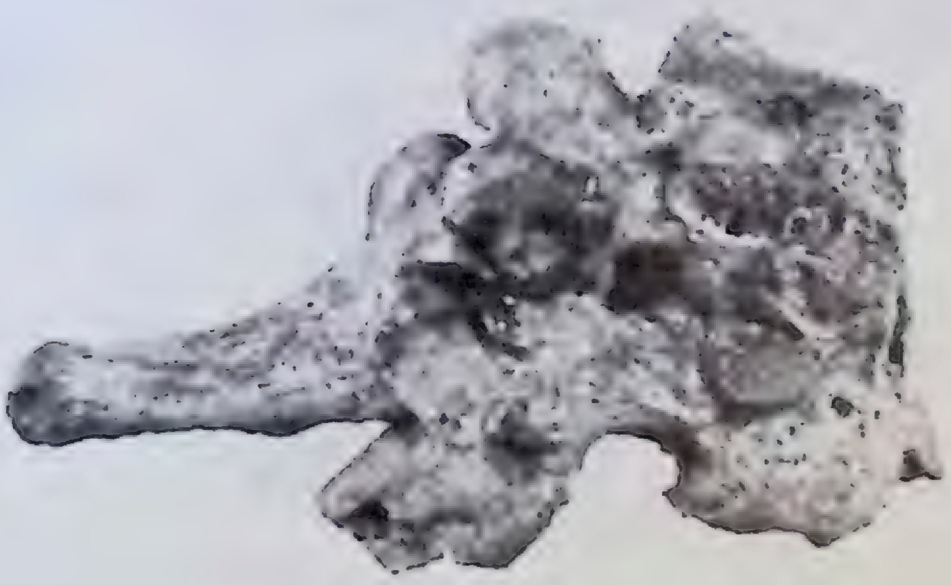
A. Two adjacent thoracic vertebrae are fused together by the huge node-like union of osteophytes from the periphery of their bodies. Notice that the apophyseal joints are not fused and show no signs of arthritis.

B. In this specimen, two adjacent thoracic vertebrae are fused together both by lipping at their bodies and by arthritic changes at the apophyseal joints.

PLATE XV



A



B

PLATE XVI

An example of spondylolysis of a lumbar vertebra. The posterior part of the neural arch is separated from the rest of the vertebra at the pars interarticularis. The posterior segment is shown in *A*, and the anterior segment in *B*.

Plate XVI

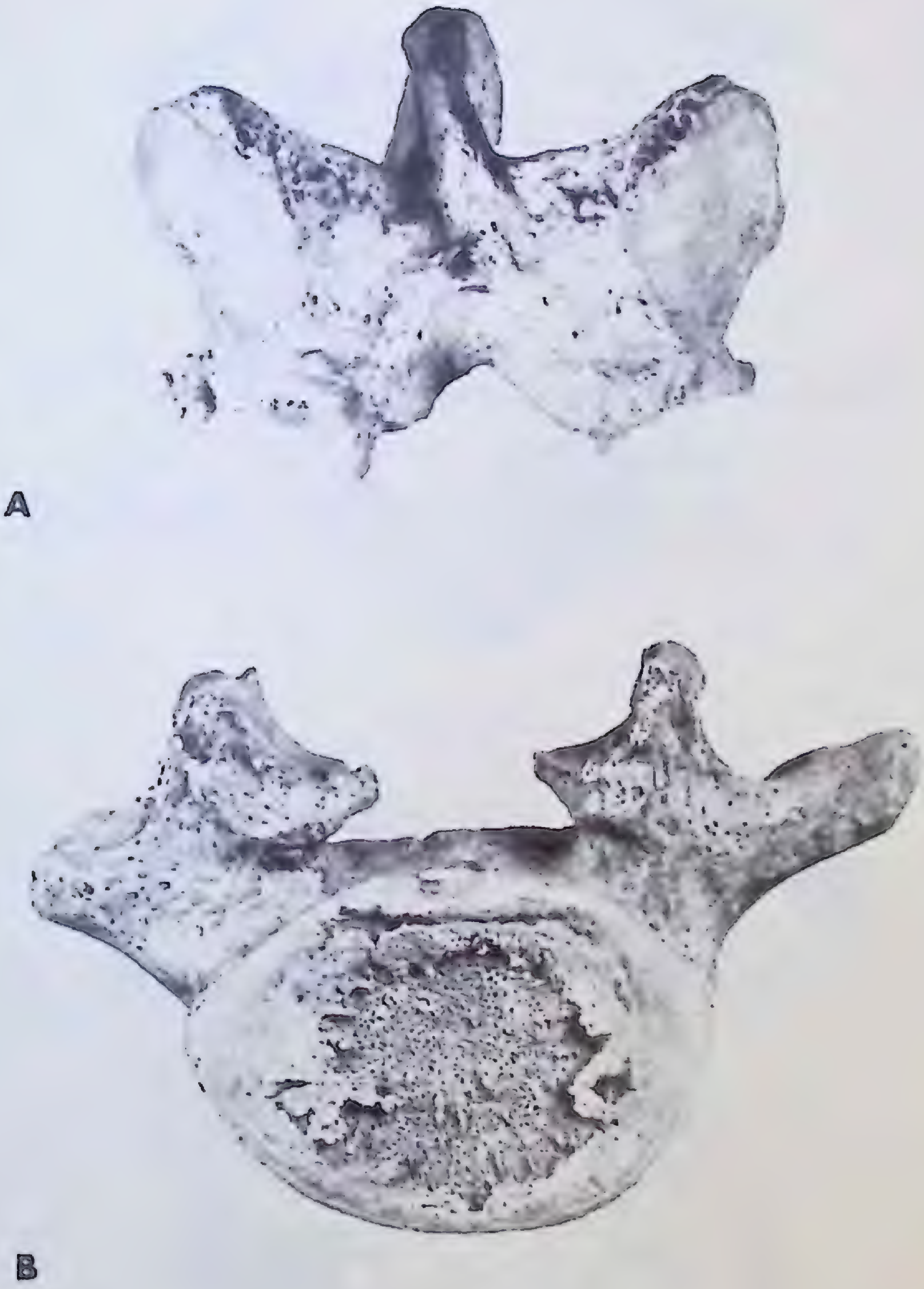


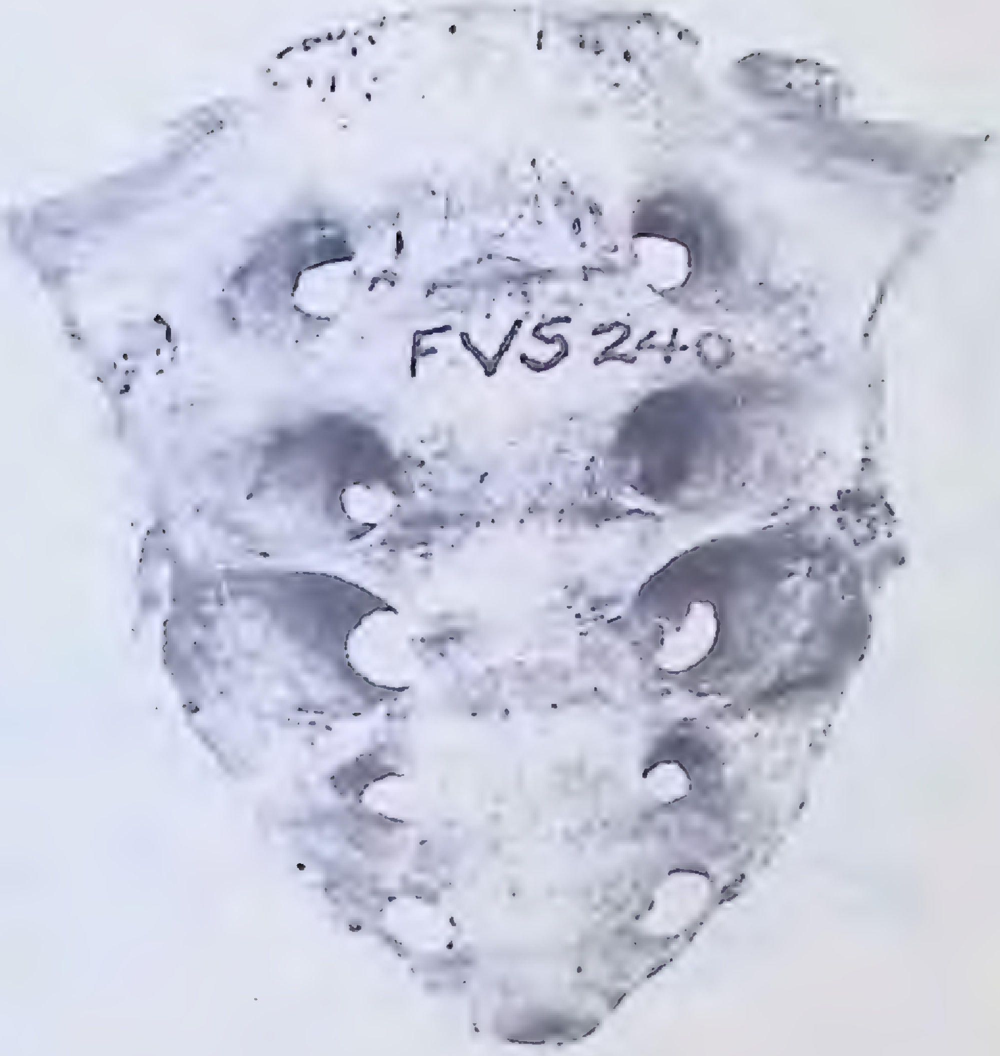
Plate XVII

In these two specimens, the sacrum consists of six segments, the result of fusion with the fifth lumbar vertebra.

A. Complete sacralization of the fifth lumbar vertebra.

B. Hemisacralization of the fifth lumbar vertebra. Although fusion is complete on the right side, the left lateral mass and the body remain unfused.

PLATE XVII



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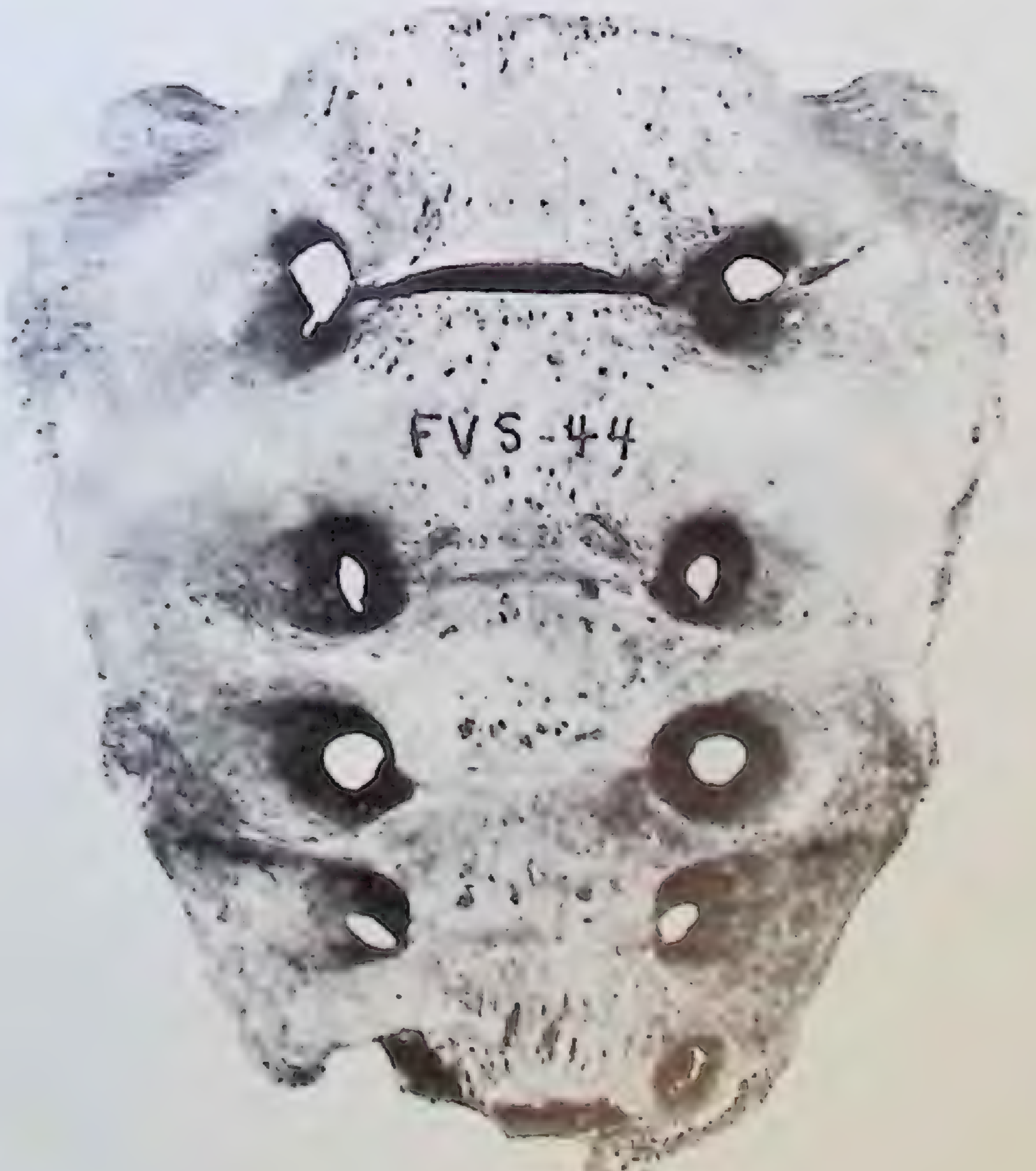


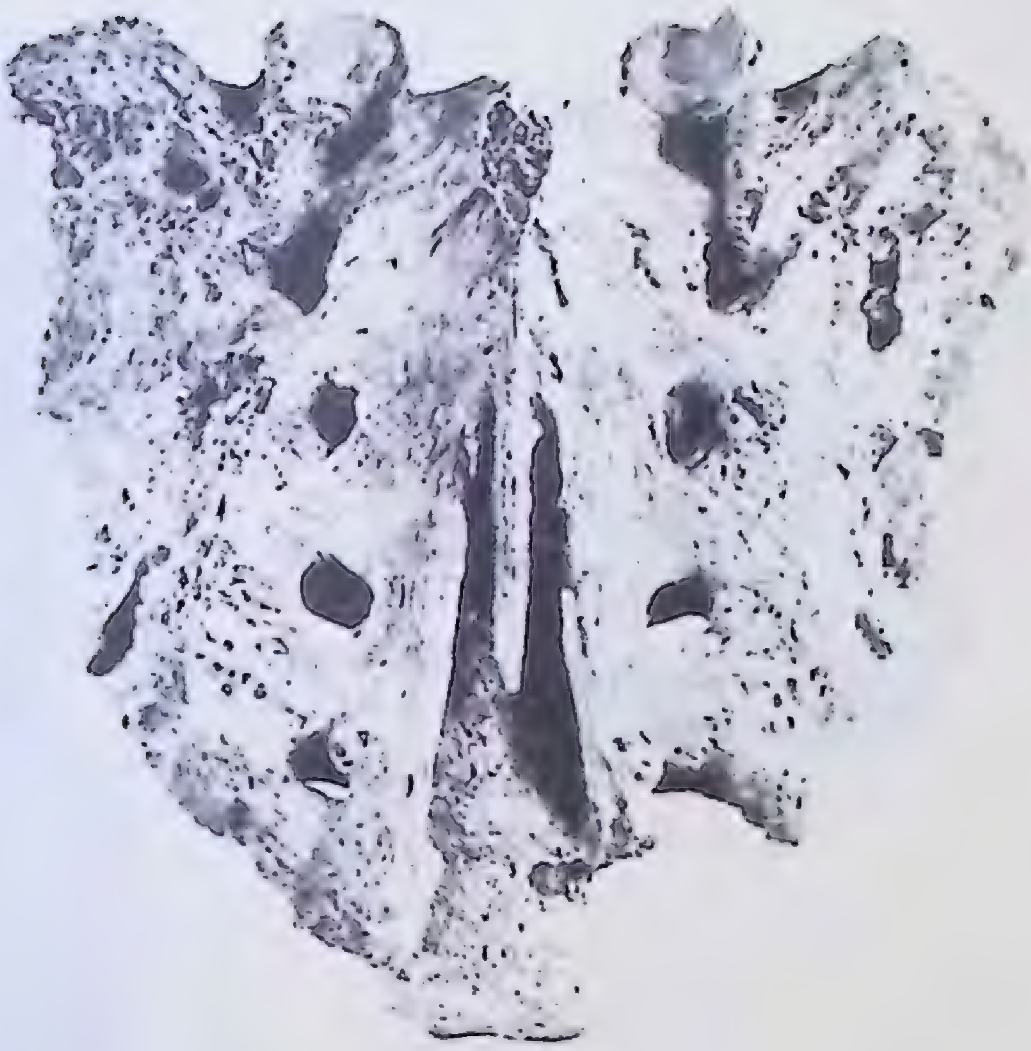
B

Plate XVIII

A. Posterior view of a sacrum in which the sacral hiatus extends upward to the level of the second posterior sacral foramen. A long narrow spine projects downwards from the apex of the hiatus.

B. A distorted coccyx whose lower segments deviate markedly to the right side.

PLATE XVIII



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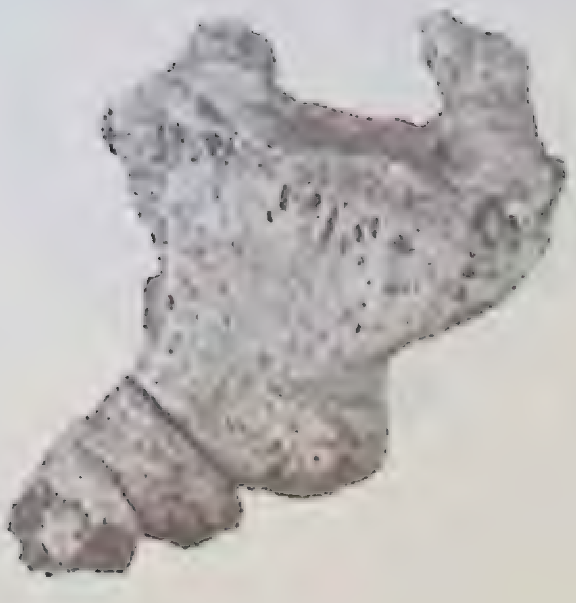


B

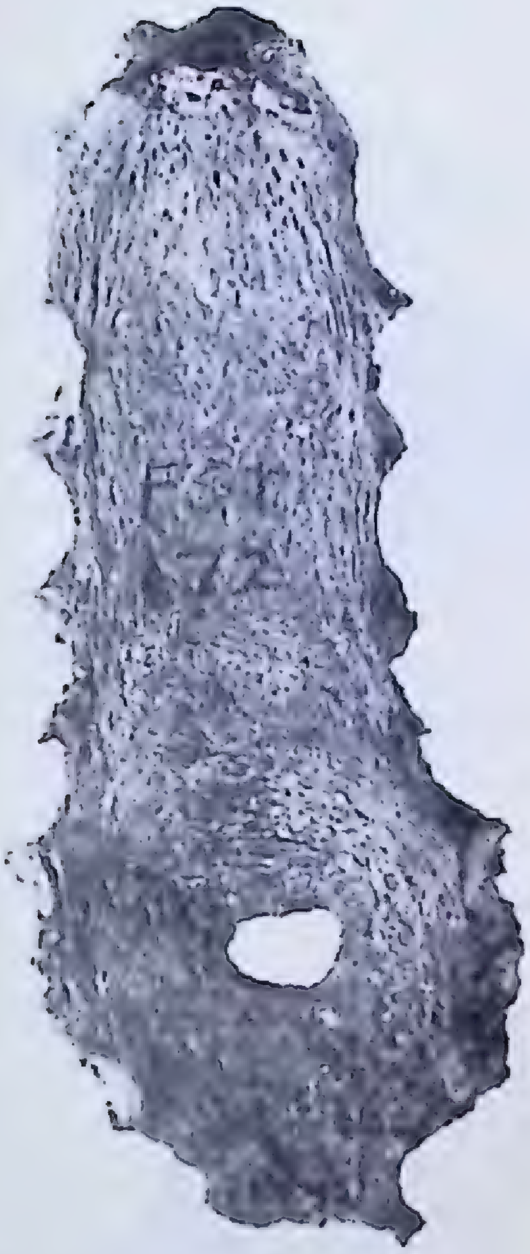
PLATE XIX

A. A sternal foramen at the junction of the third and fourth sternebrae.

B. A developing sternebra showing its origin from multiple asymmetrical centres of ossification.

C. Anterior view of a manubrium with ossification and fusion of the first left costal cartilage.

Plate XIX



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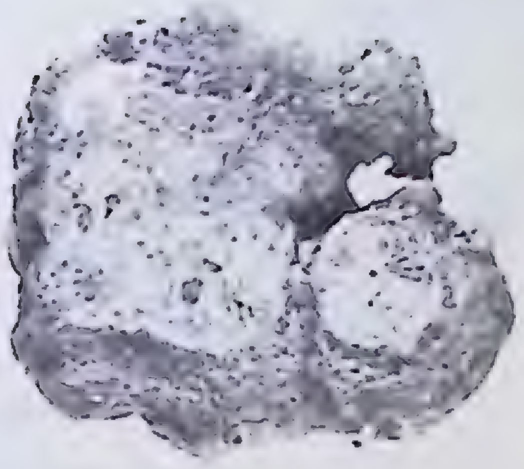
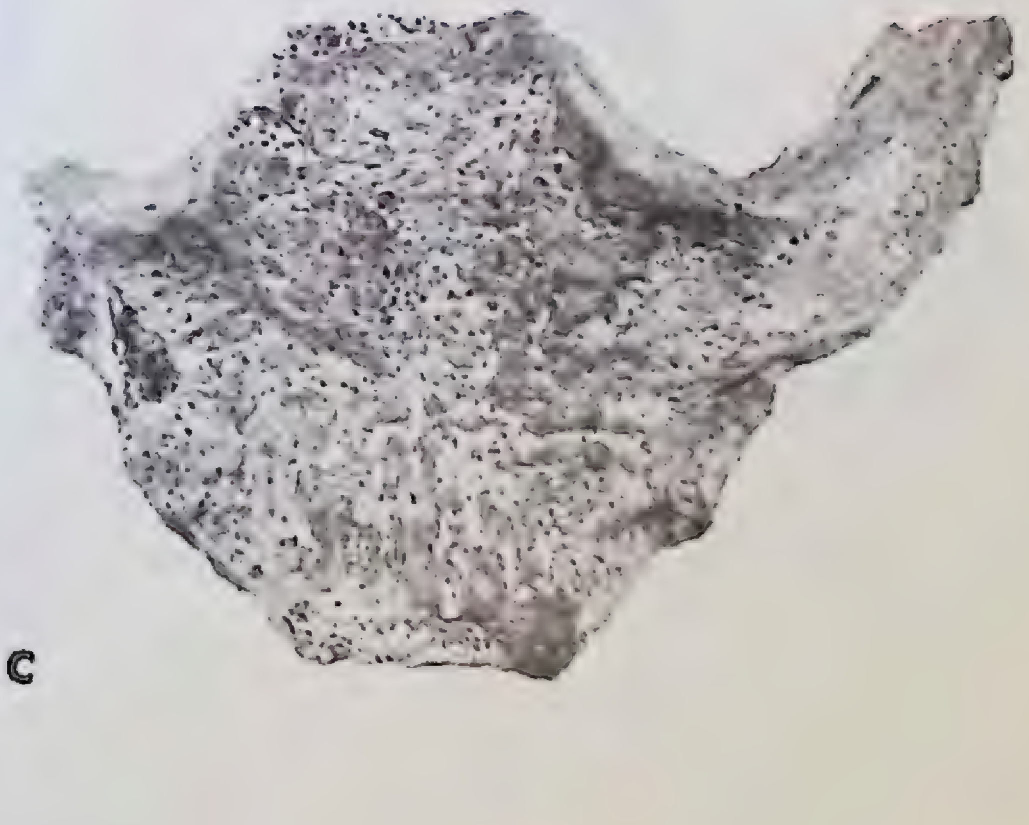


B



C

PLATE XX

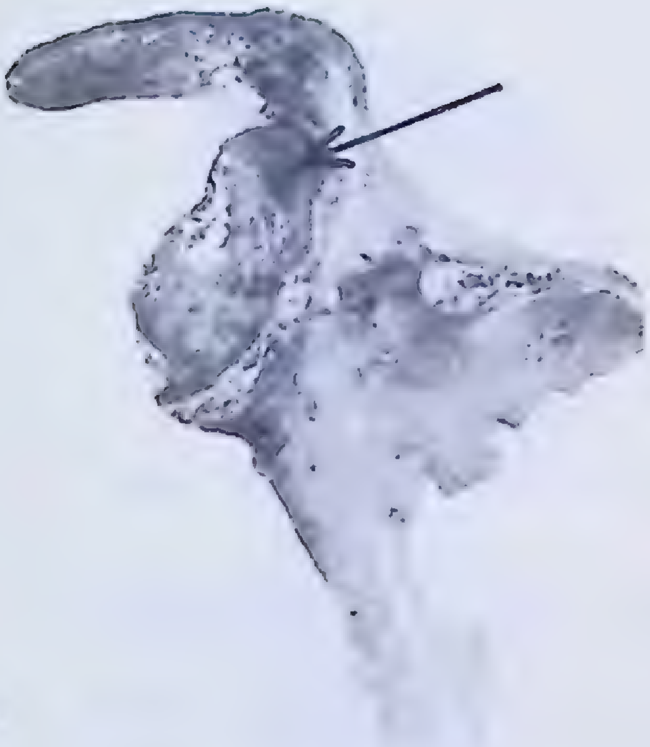
A. Posterior view of a left scapula. There is a large extension of the postero-superior region of the glenoid fossa.

B. Ossification of the suprascapular ligament producing a foramen on the superior border of the scapula.

C. Marked arthritic involvement of the glenoid fossa with flattening, erosion, and peripheral lipping.

D. An adult scapula in which the epiphysis for the tip of the acromion has not fused.

PLATE XX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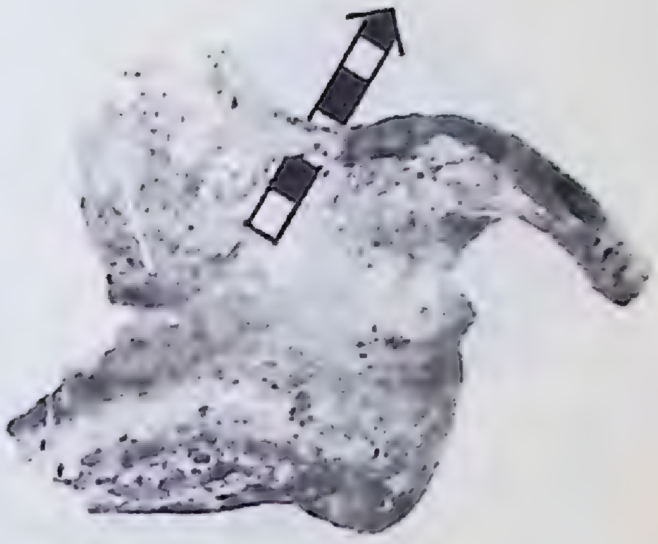
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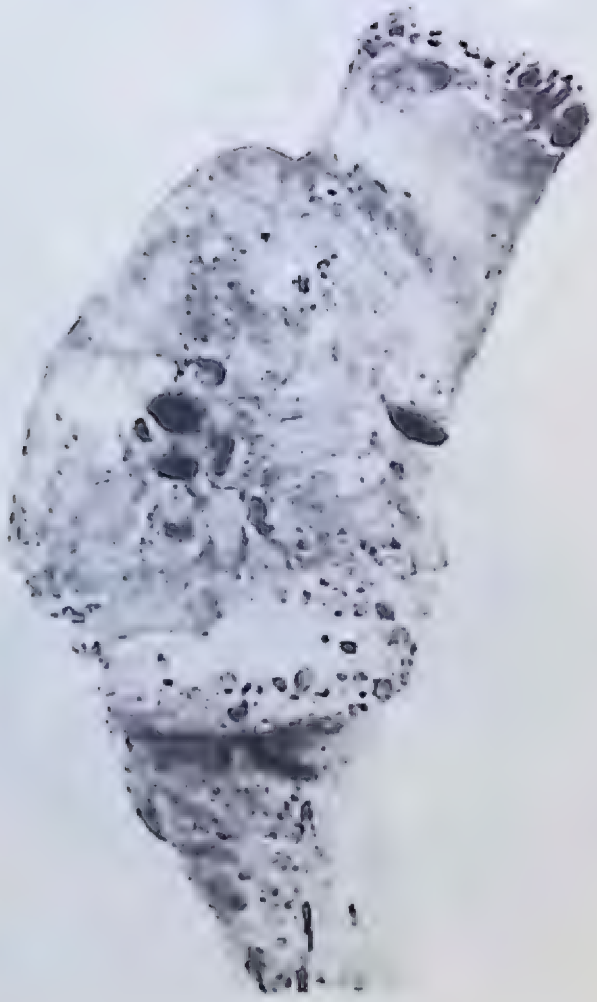

C

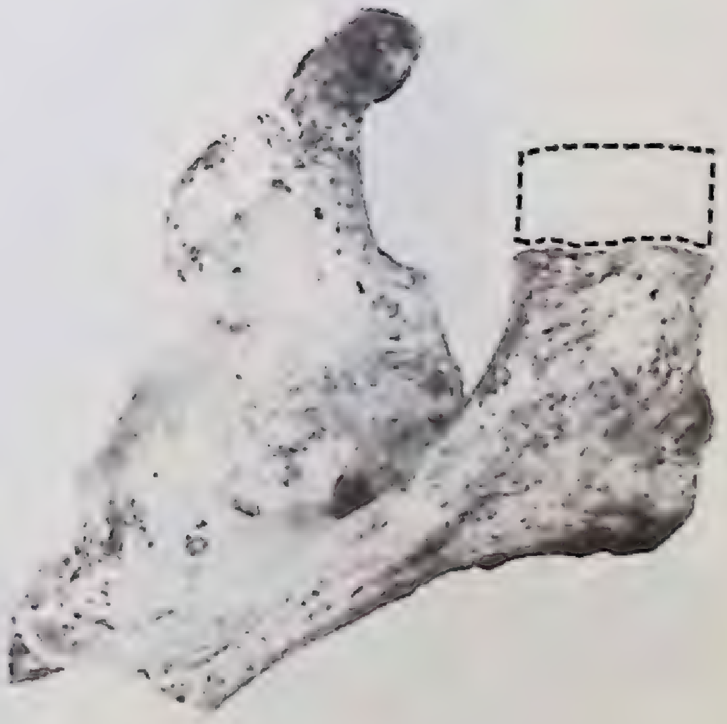

D

Plate XXI

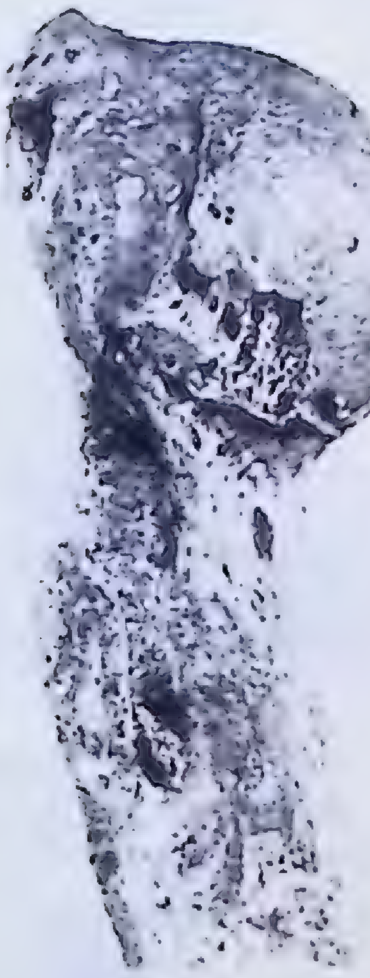
A. A healed fracture of the neck of the humerus with distortion of the proximal end.

B. The proximal end of a humerus in which the head has been destroyed perhaps from the effects of a septic arthritis.

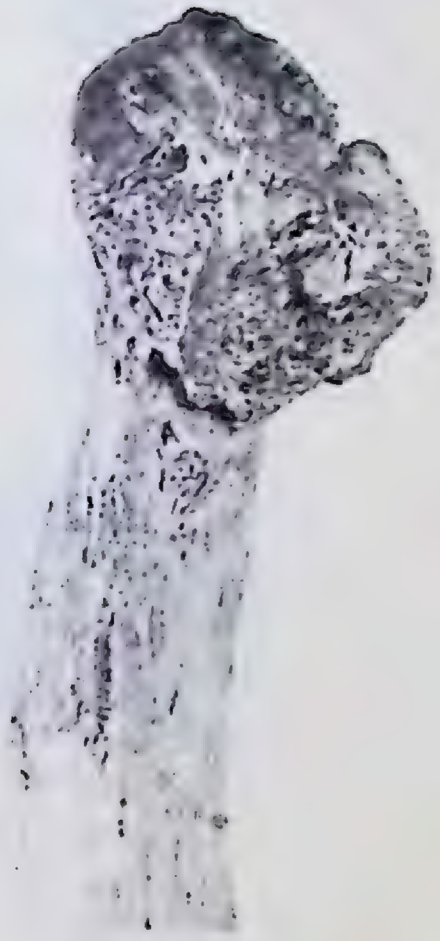
C. The typical appearance of osteoarthritic involvement of the distal end of the humerus. There is a round area of erosion on the capitulum.

D. A healed fracture of the distal end of the humerus with minimal displacement of the fragments.

PLATE XXI



A



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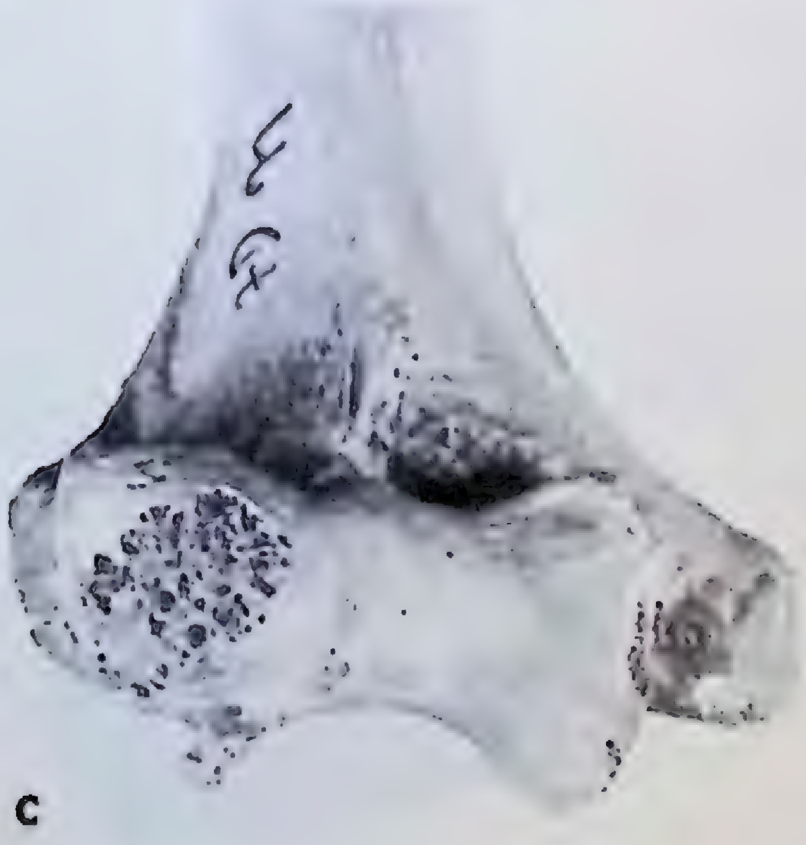
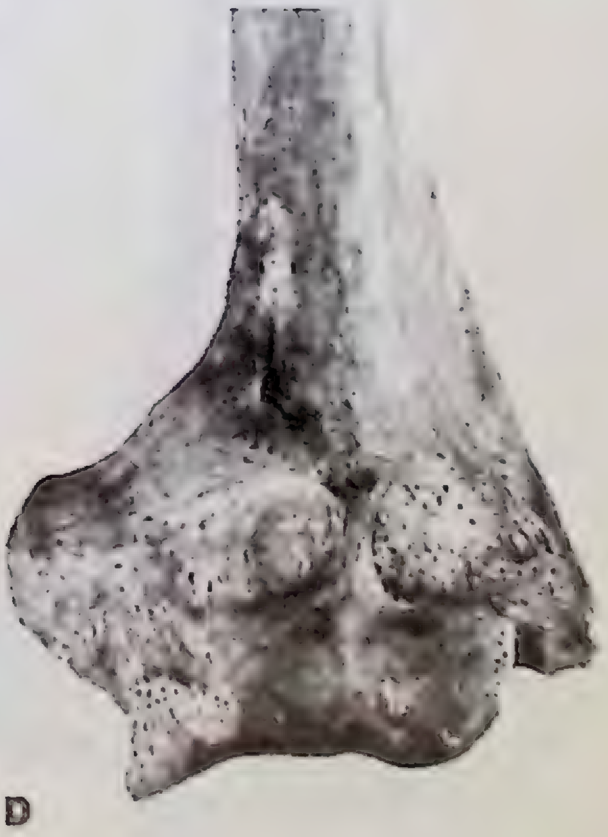


C



D

PLATE XXII

Two anomalies of the humerus

A *supratrochlear process*, a small spur of bone projecting from the antero-medial surface of the shaft of the humerus near its distal end. Only two examples were found on this site, one in a child (A) and the other in an adult (B).

A *septal aperture*, a foramen in the coronoid fossa of the humerus. Two examples are shown here: one in a child prior to the fusion of the distal humeral epiphysis (C), and one in an adult (D).

PLATE XXII

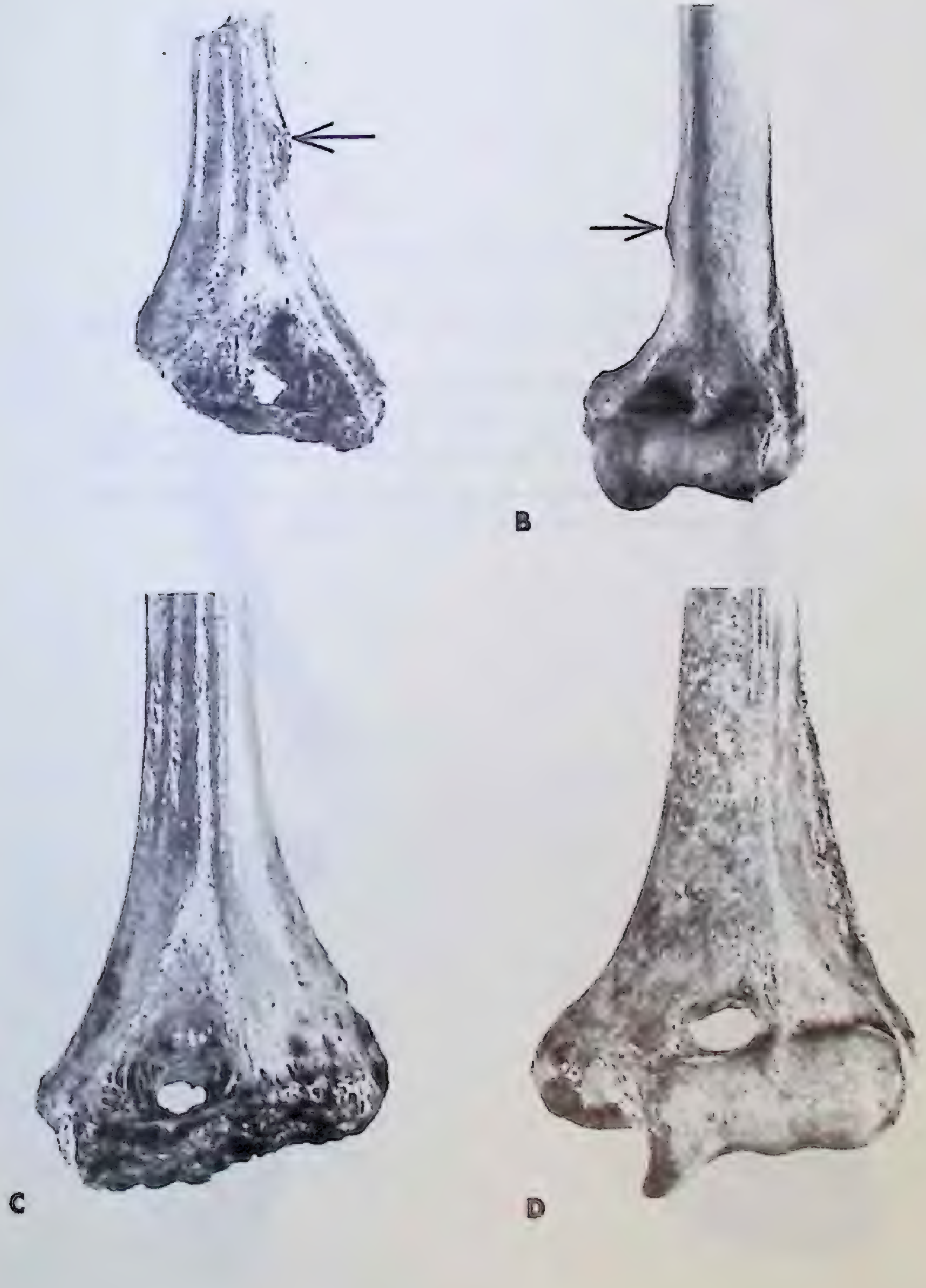


PLATE XXIII

A. An adult ulna with marked bowing of the distal one-third of the shaft.

B. A healed fracture of the shaft of the ulna.

C. The proximal end of the left ulna. The area for articulation with the head of the radius consists of two discrete facets.

D. A healed fracture of the distal end of the radius with considerable deformity at the wrist joint.

PLATE XXIII

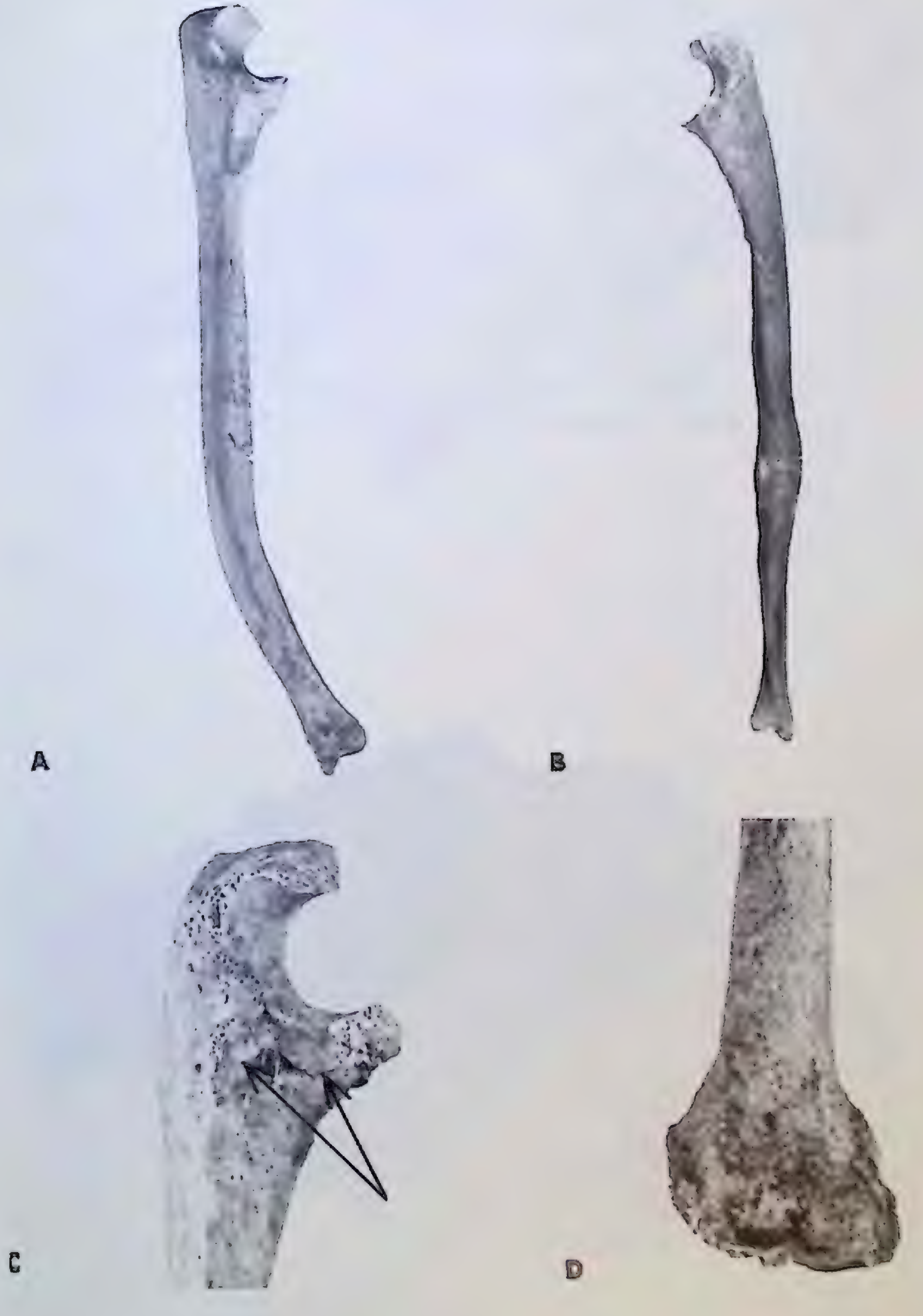
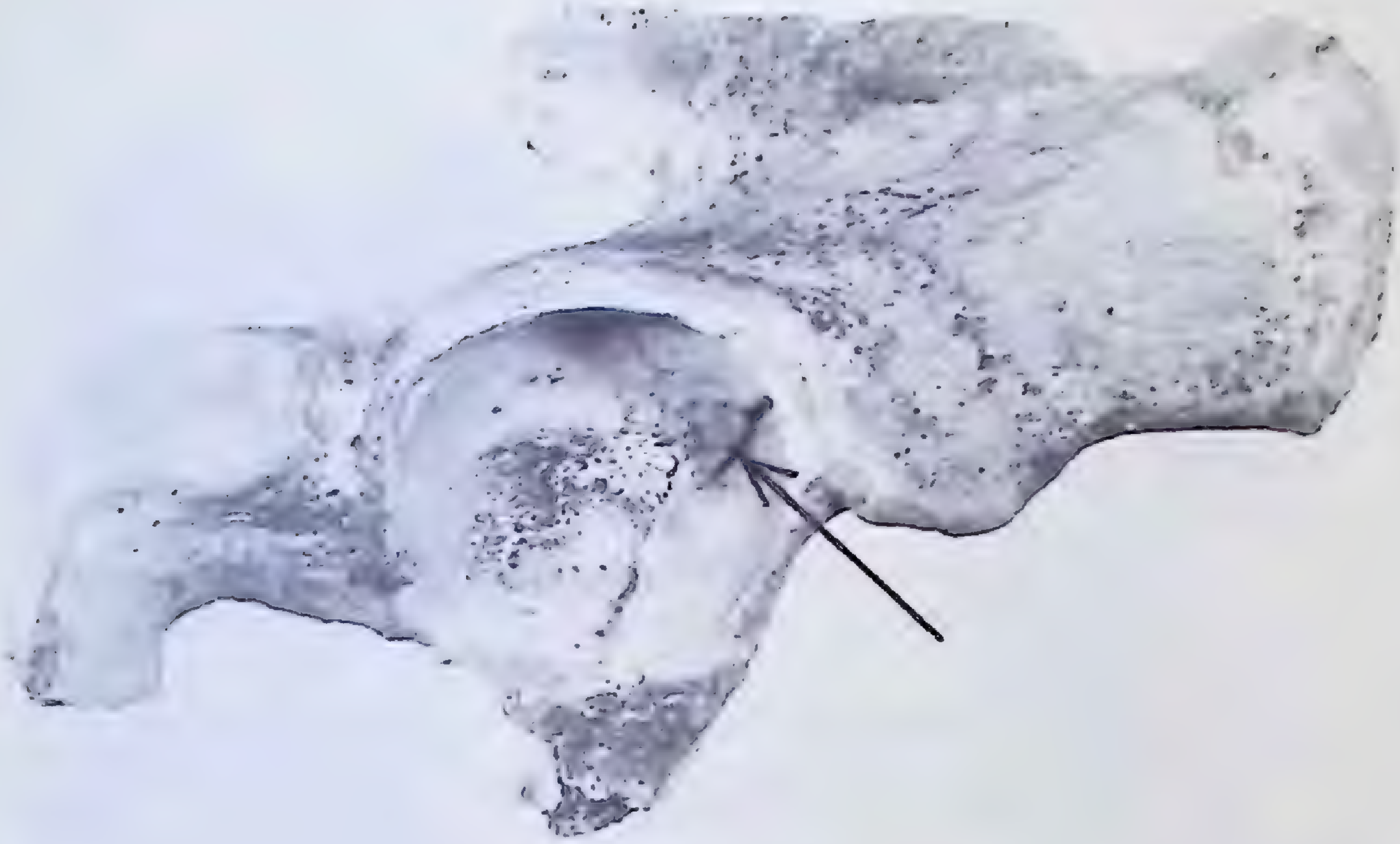


PLATE XXIV

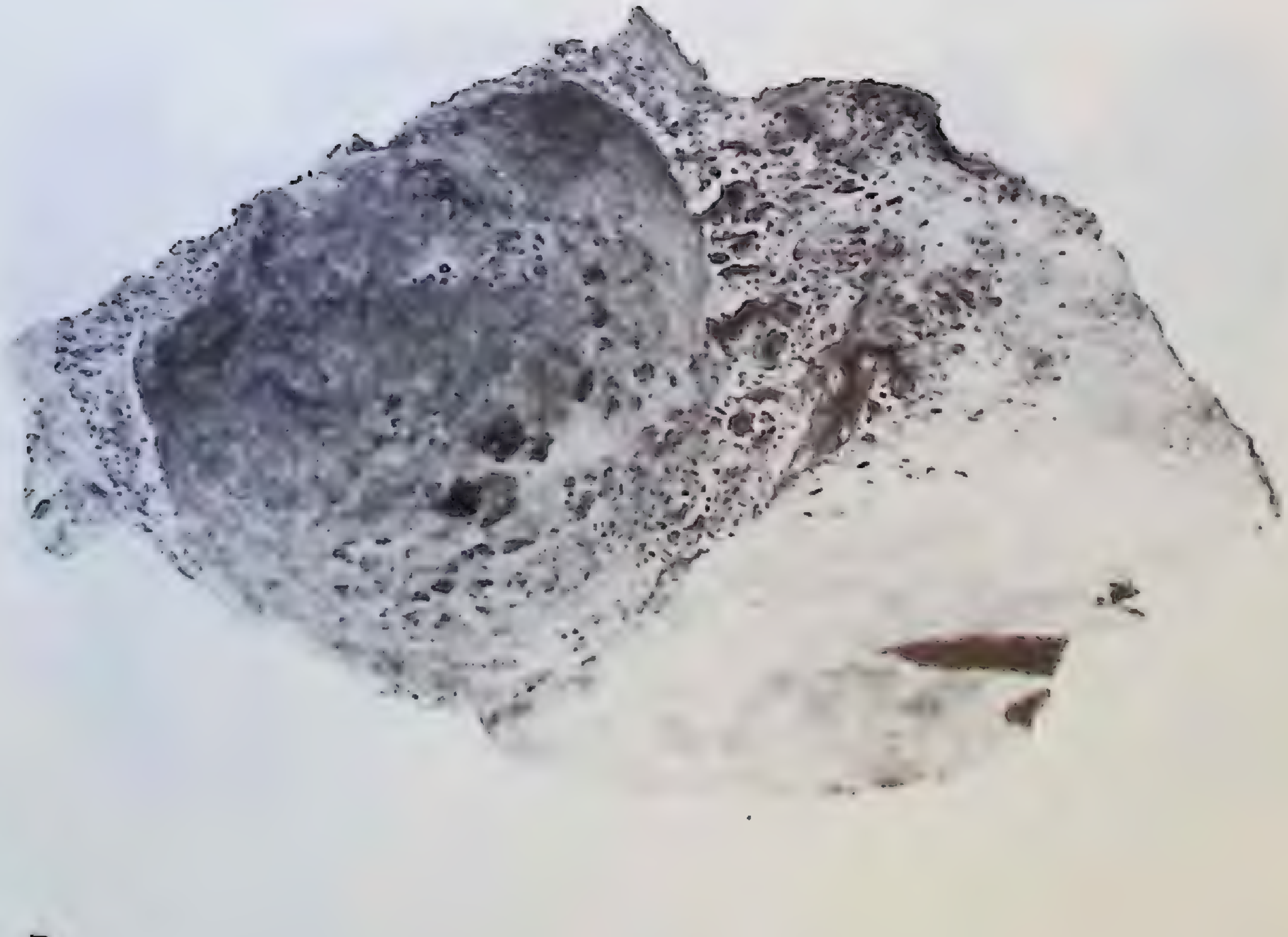
A. There is a *V*-shaped slit in the upper part of the articular surface of the acetabulum.

B. A fragment of innominate bone showing an acetabulum grossly distorted from the effects of osteoarthritis.

PLATE XXIV



A



B

Plate XXV

A. The proximal end of a young humerus showing the effects of osteomyelitis, with involucrum formation and two cloacae.

B. The proximal end of an adult femur showing distortion of the greater trochanter. (The ragged appearance of the head is due to postmortem damage.)

C. Osteoarthritis of the head of the femur with erosion and marked peripheral lipping.

D. An adult femur with flattening of the head to the "mushroom" form characteristic of Legge-Perthe's disease.

Plate XXV

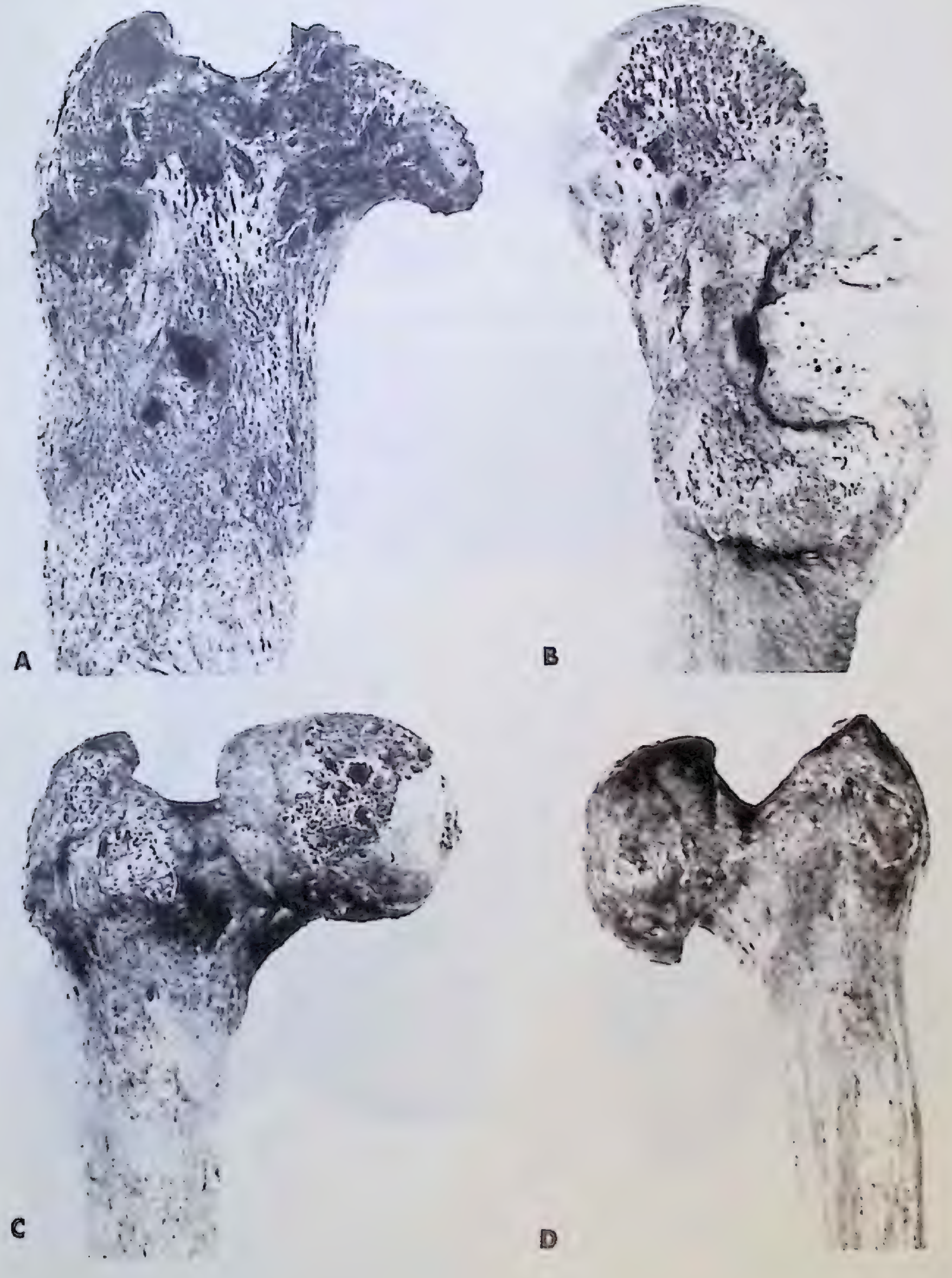


PLATE XXVI

A. An ossified subperiosteal hematoma on the shaft of a femur.

B. Osteomyelitis of the shaft of the femur with a draining sinus.

C. A posterior view of the distal end of a femur. There are small, discrete nodes of new bone on the articular surfaces of the condyles.

D. An example of Brodie's abscess, a chronic infection with cavity formation at the distal end of a long bone, in this case a femur.

Plate XXVI

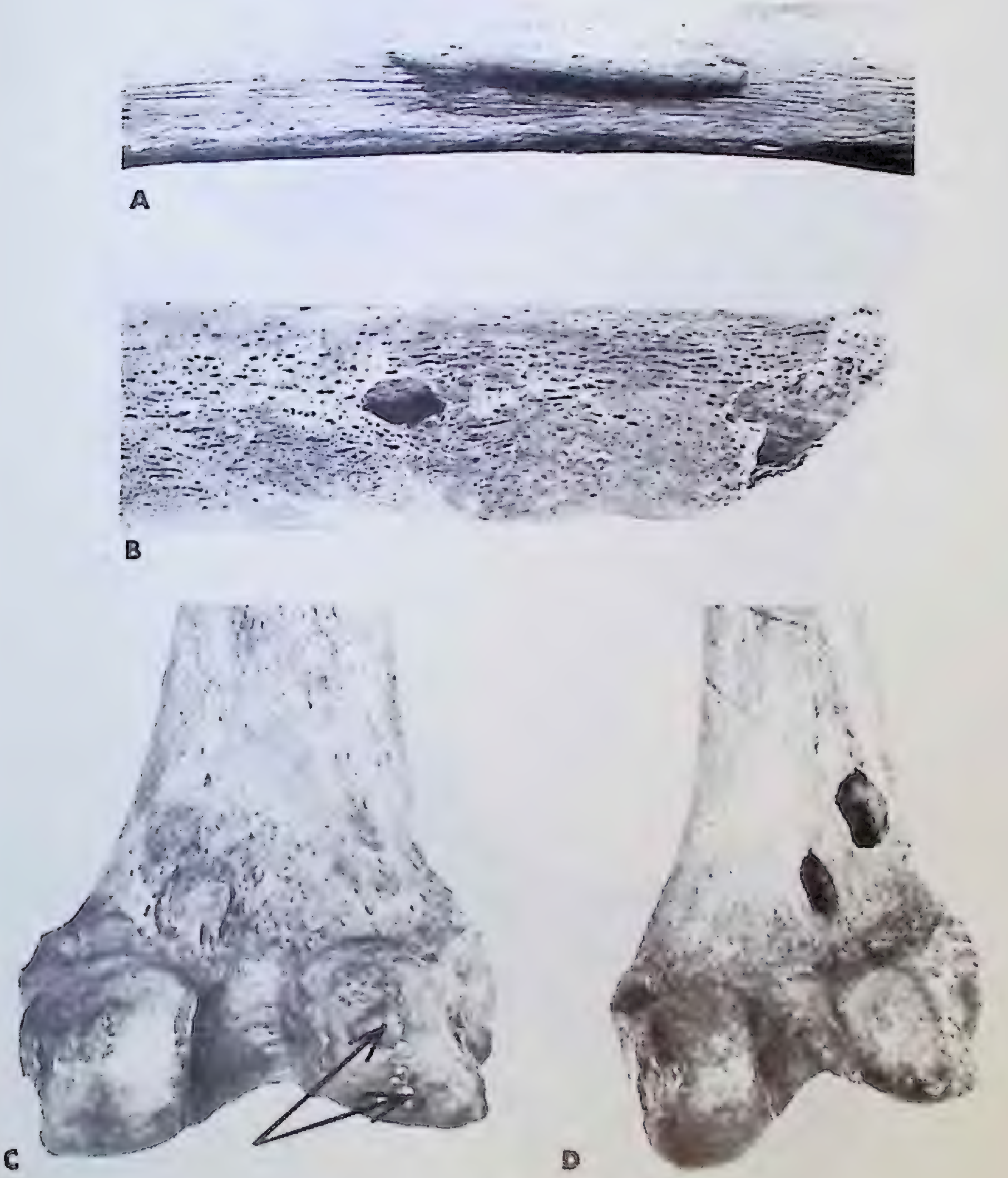
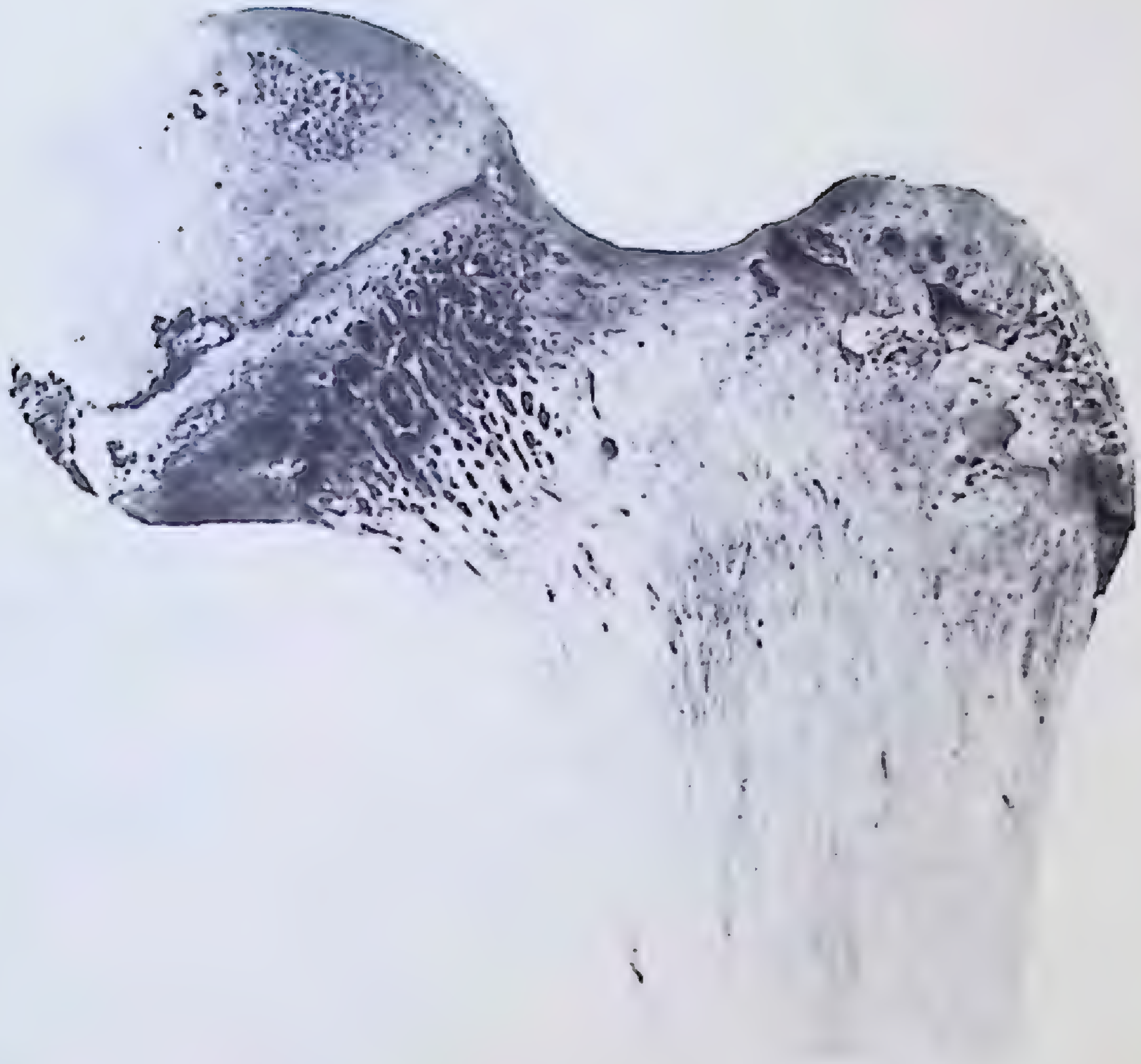


PLATE XXVII

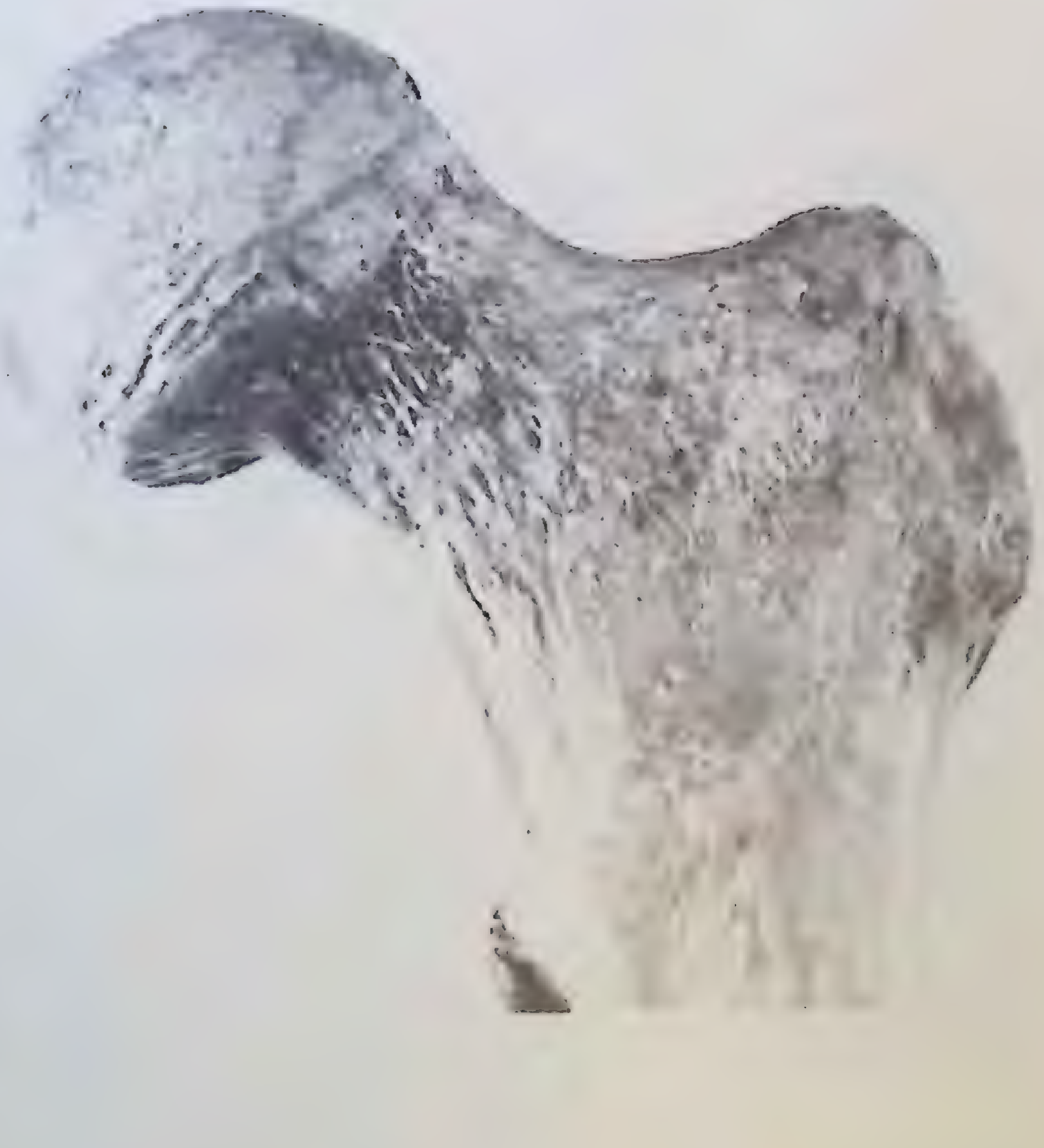
A. The proximal end of a young femur with epiphyses just beginning to fuse. Notice the porous area on the front of the neck which is present in young femora through the process of remodelling.

B. A somewhat older femur in which the epiphyses have fused. The area of exposed cancellous bone seen above is smaller, and its margins are rounded, giving the appearance of an ulcer.

PLATE XXVII



A



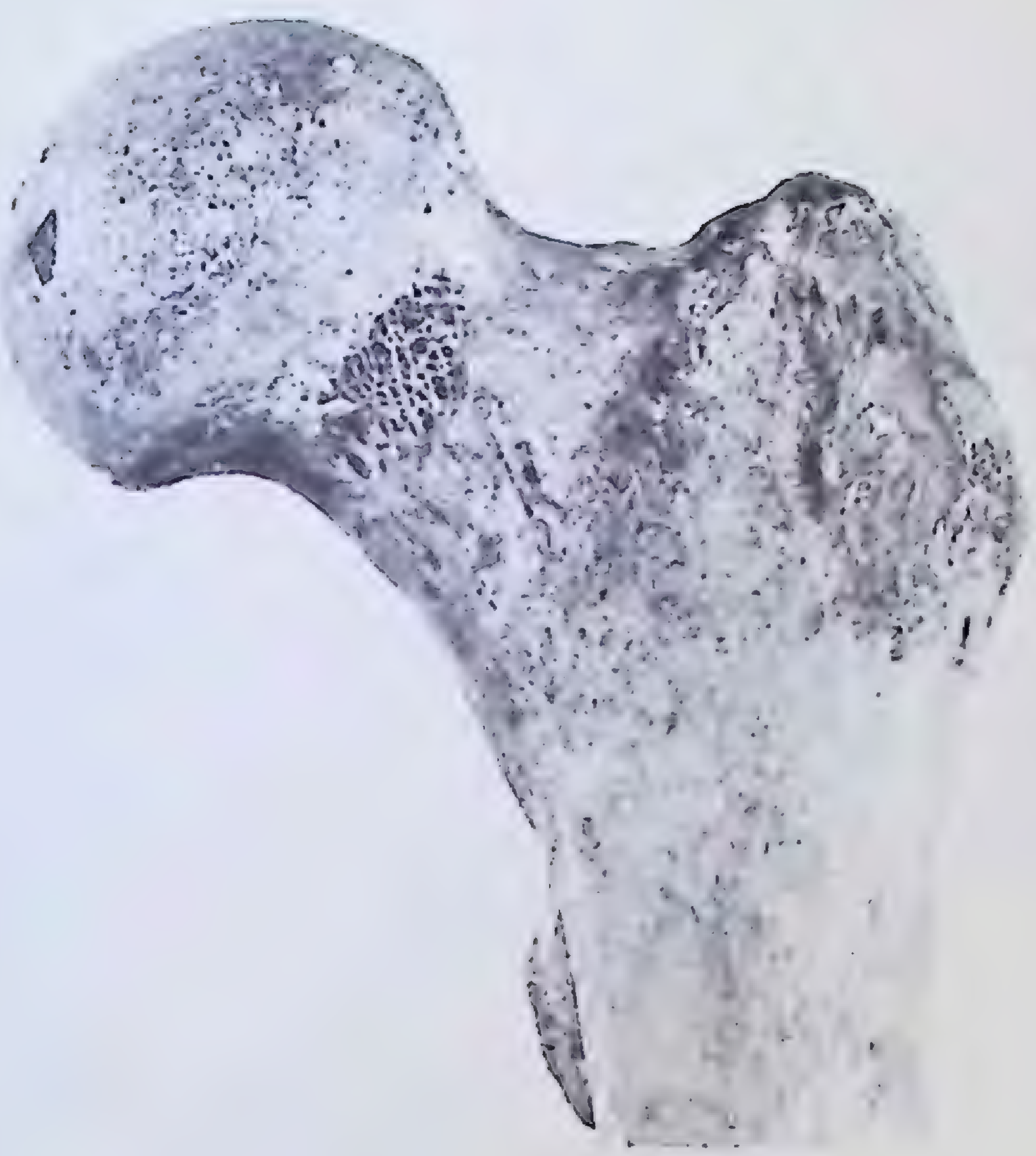
B

Plate XXVIII

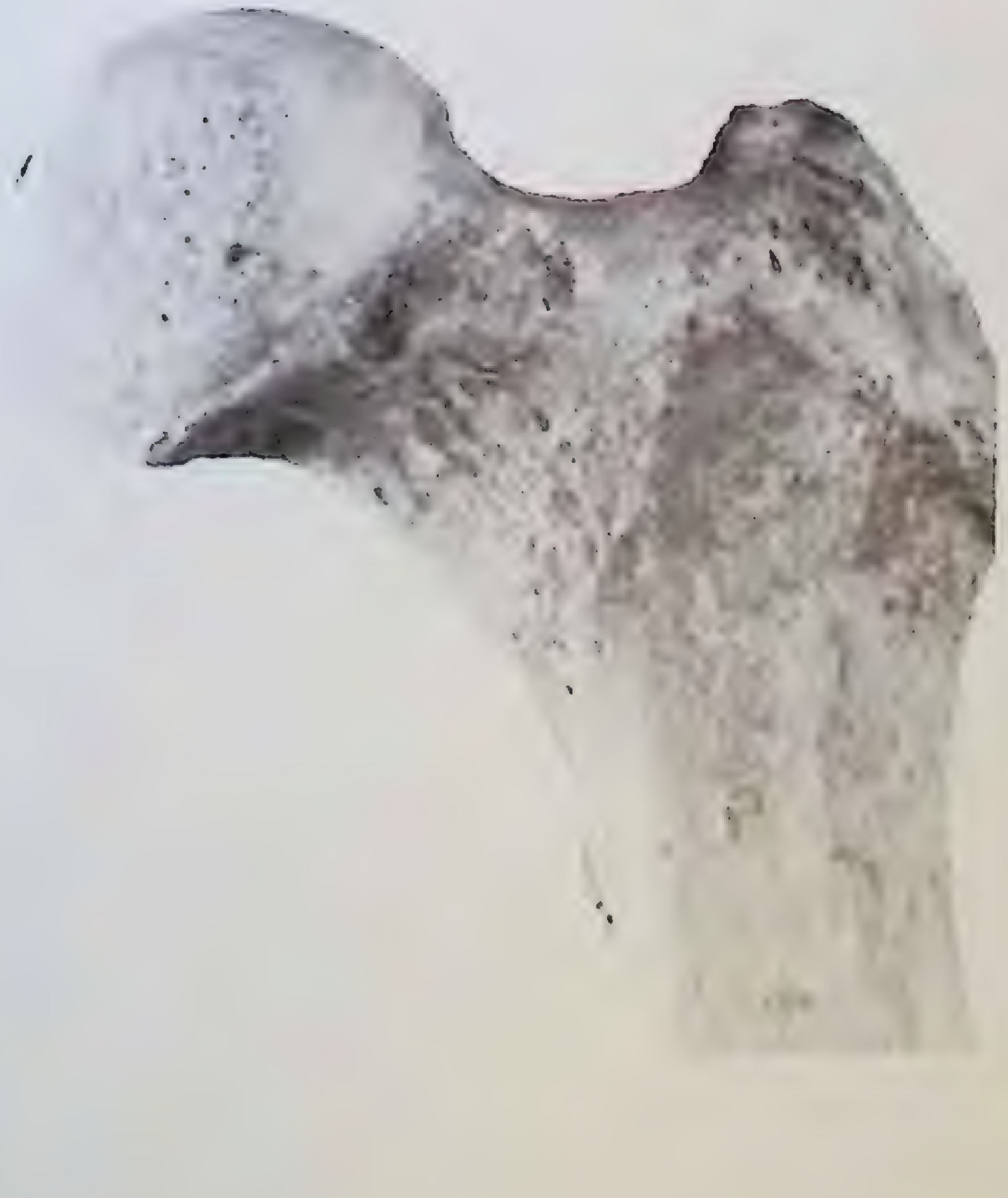
A. A further stage in the formation of the neck of the femur. The area of exposed cancellous bone seen in the previous plate is smaller, on account of encroachment of new bone from its margins.

B. An older femur in which compact bone covers the previously exposed area of cancellous bone. A fingertip depression remains in the region, the Fossa of Allen.

PLATE XXVIII



A



B

PLATE XXIX

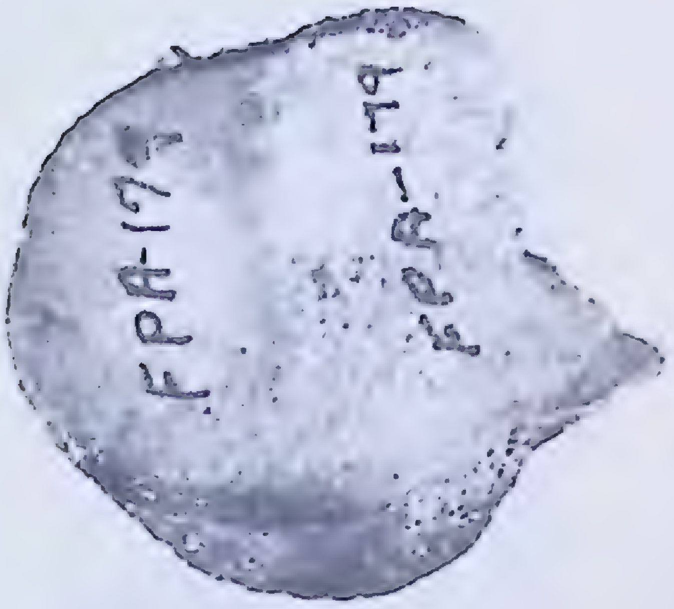
A. Posterior view of a right bipartite patella. There is a defect in the upper lateral region, due to development from more than one centre of ossification.

B. Anterior view of a patella showing spurs of bone extending both superiorly and inferiorly from this surface.

C. The posterior surface of a patella with marked evidences of osteoarthritis. Notice the peripheral lipping, osteophyte formation, and the polished, grooved appearance of eburnation.

D. Posterior view of a patella showing the characteristic early sign of bony involvement from osteoarthritis, a localized area of erosion of the articular surface.

PLATE XXIX



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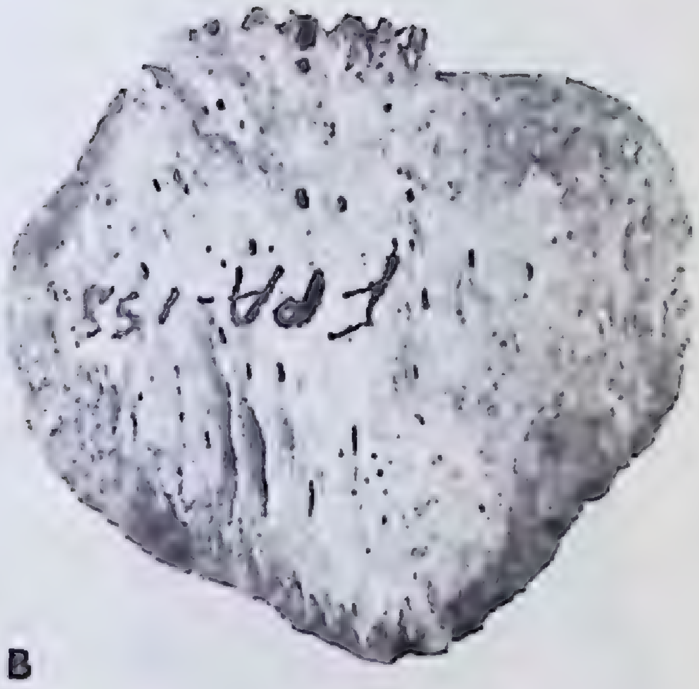
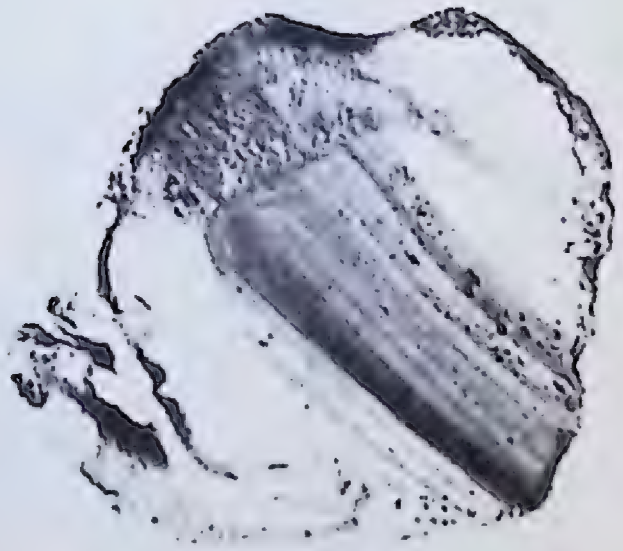


B



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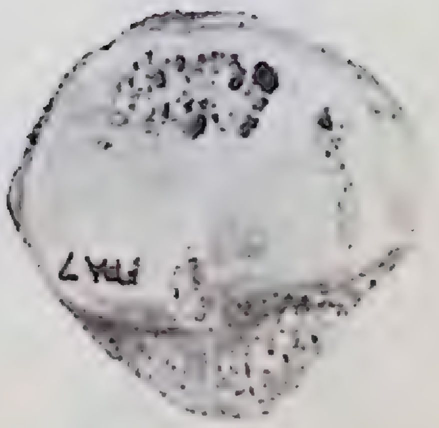


D

PLATE XXX

A. Osteomyelitis of the distal end of a tibia with a large draining sinus.

B. Periostitis of the distal end of a tibia.

C. The shaft of a fibula with periostitis and localized ossification into fibrous tissue.

D. The distal end of a fibula with osteoarthritic changes at the ankle joint.

PLATE XXX

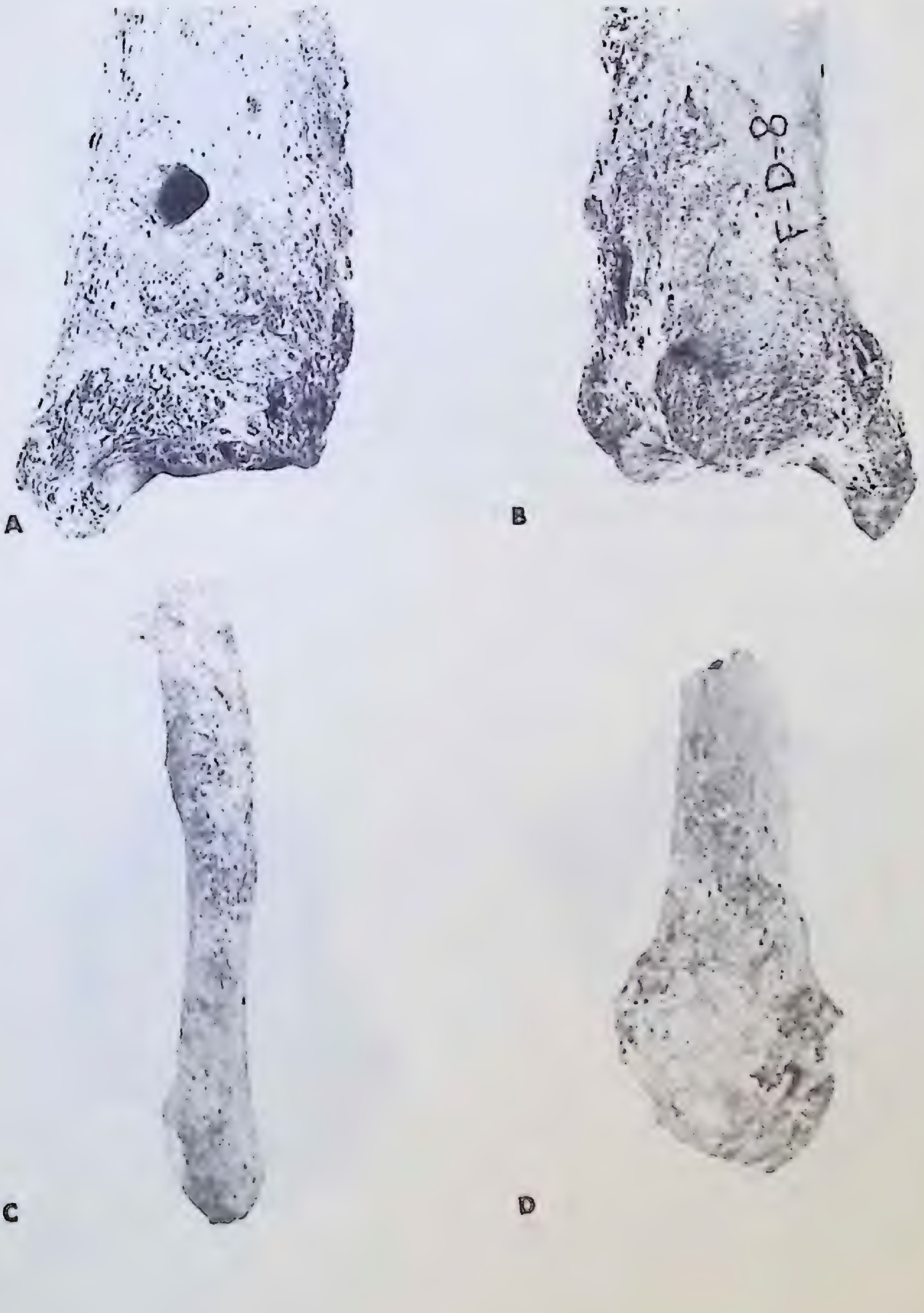
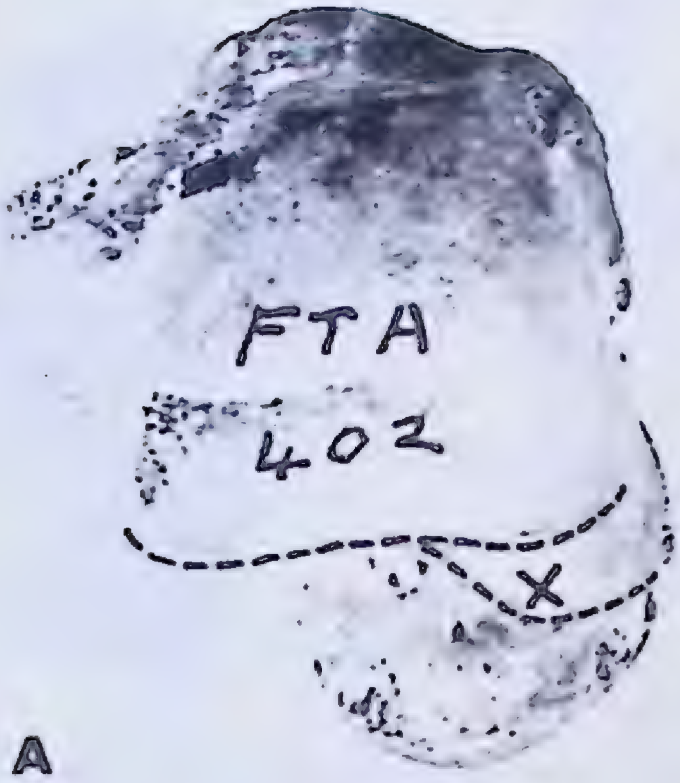


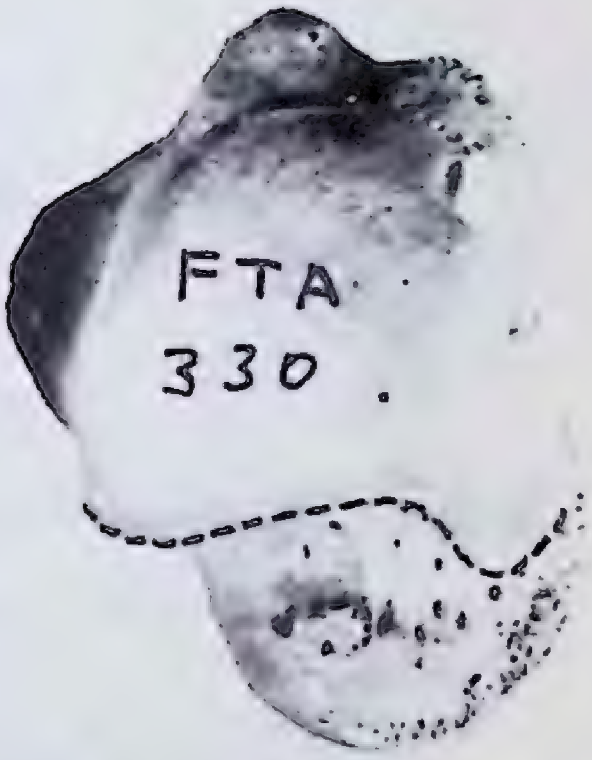
Plate XXXI

Variations in the appearance of the upper surface of the talus due to extensions of the joint surfaces, the so-called "squatting facets." Compare specimen *A*, which has a joint surface passing anteriorly on the neck, with specimen *B*, in which this medial extension is not present. In *C*, there is marked flaring of the medial part of the ankle joint. *D* illustrates a discrete articular facet on the neck of the talus, which in this case shows arthritic involvement with lipping and osteophyte formation.

Plate XXXI



A



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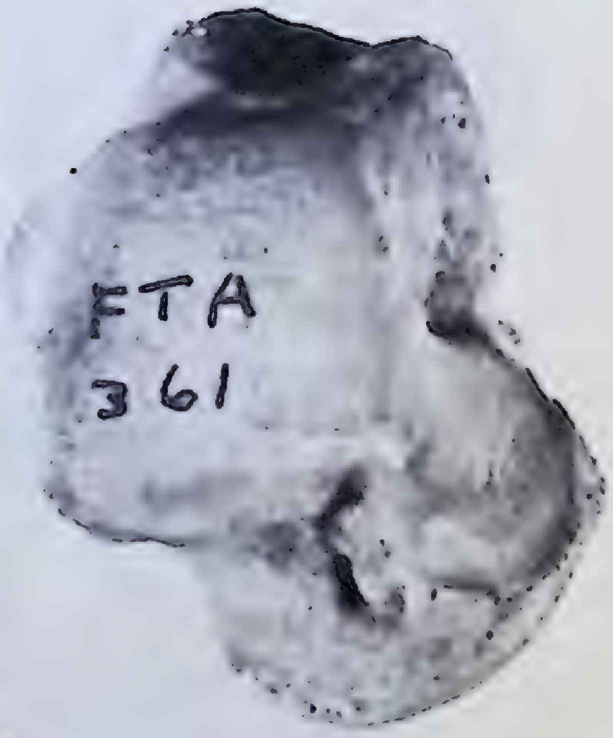

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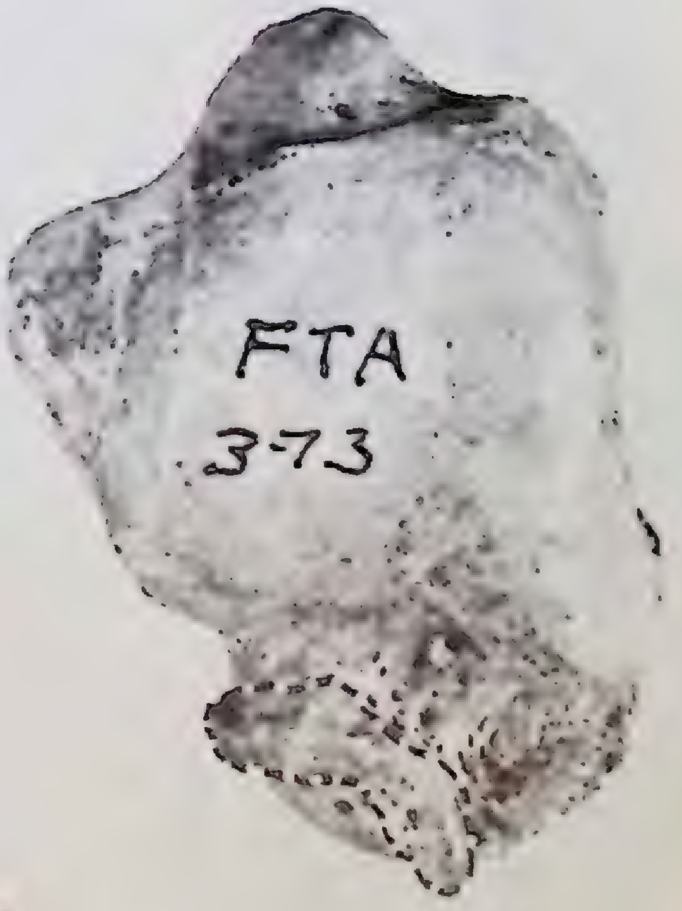


D

Plate XXXII

Variations in the anterior and middle facets of the calcaneus:

A. The anterior and middle calcaneal facets form a single oval area.

B. Anterior and middle facets merge with each other forming an hour-glass-shaped articular surface.

C. Anterior and middle facets are quite discrete and are separated from each other by a non-articular area.

D. In this calcaneus, the anterior calcaneal facet is absent.

E. An emarginate anterior calcaneal facet.

PLATE XXXII

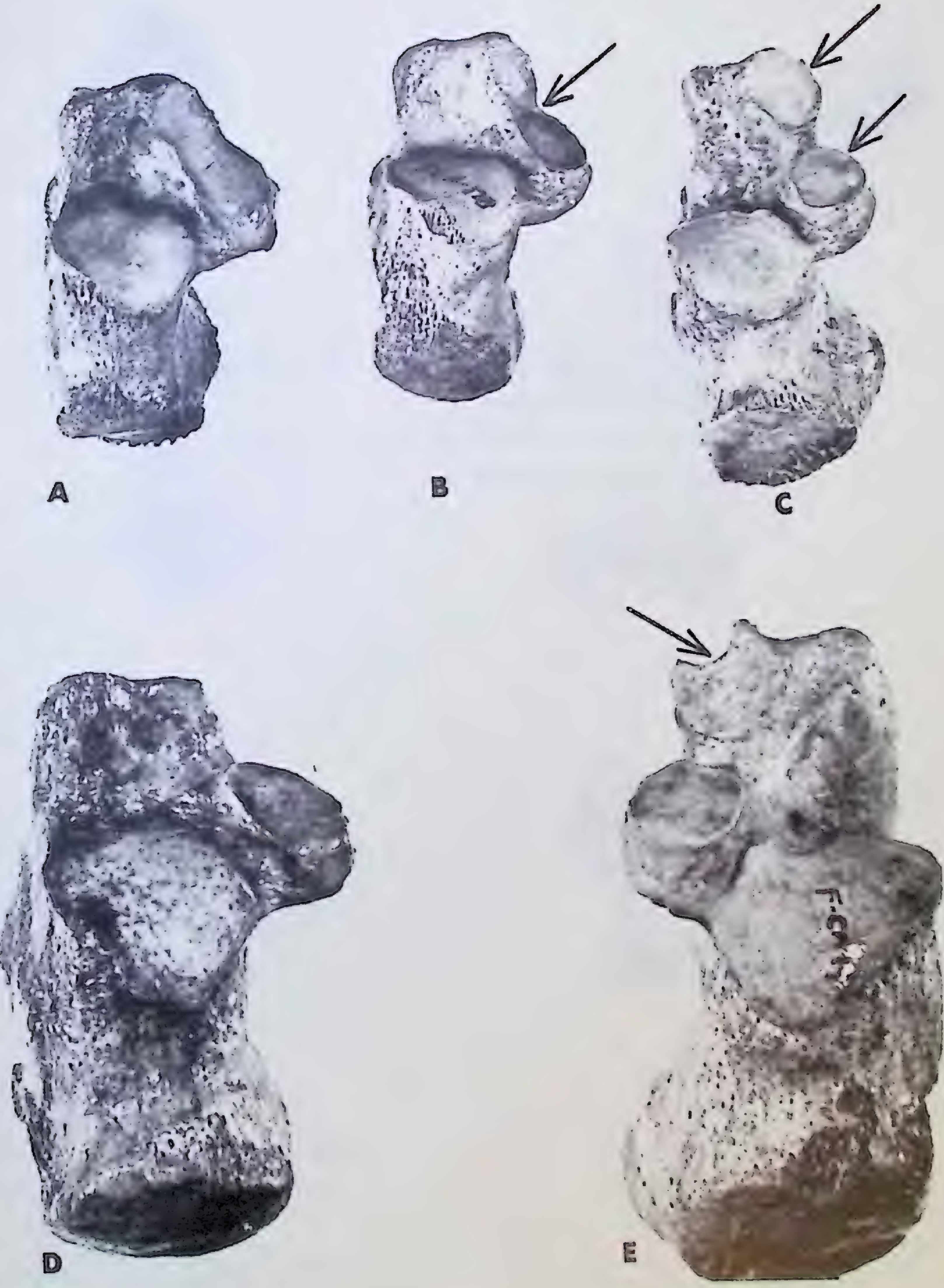


Plate XXXIII

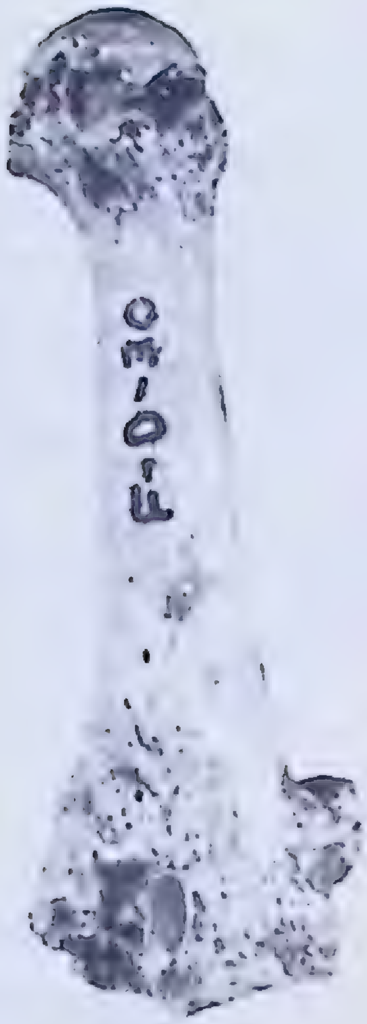
A. An osteophyte near the proximal end of a metatarsal.

B. The first metatarso-phalangeal joint is fused in flexion and shows considerable lipping and distortion, probably secondary to a healed fracture.

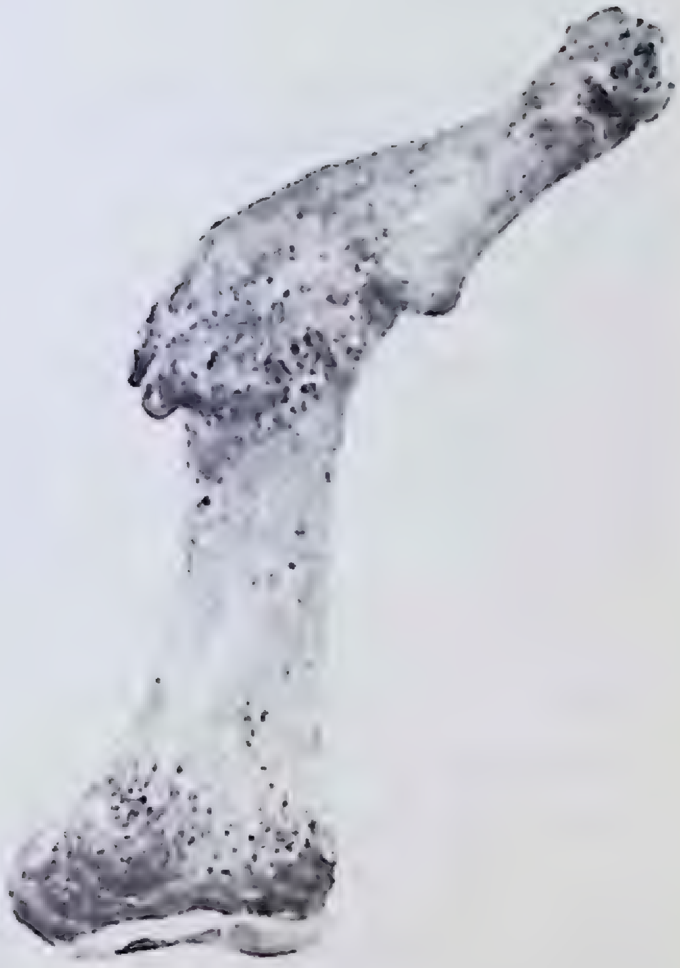
C. Osteomyelitis of a cuboid with cavity formation.

D. Fusion of two cuneiforms.

Plate XXXIII



A



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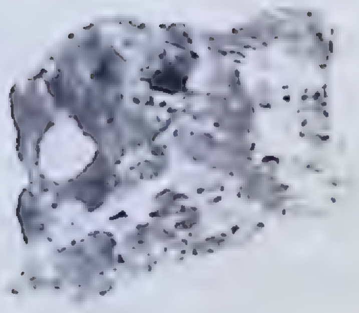

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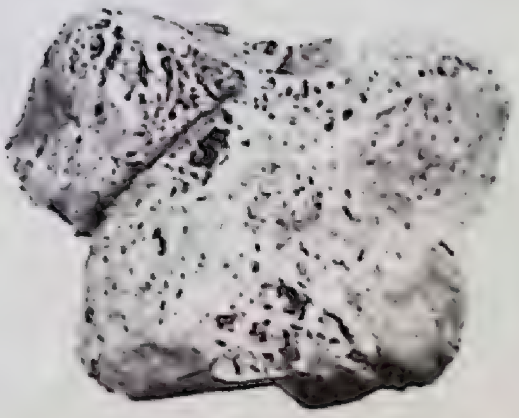

D

EXCAVATIONS AT NESIKEP CREEK (EdRk:4), A STRATIFIED SITE NEAR LILLOOET, BRITISH COLUMBIA: A PRELIMINARY REPORT

By David Sanger*

INTRODUCTION

In the summer of 1962 archaeological investigations were carried out at the stratified site EdRk:4, 16 miles south of Lillooet in south-central British Columbia. The site is located 200 feet above the Fraser River on its right or west bank, and on the right bank of a small tributary, Nesikep Creek (*see* Figure 1). Financed by a contract with the National Museum of Canada, and in conjunction with the University of British Columbia, the excavations were under the general supervision of Dr. C. E. Borden of the University. I should like to express my thanks to Dr. Borden for his guidance and to our very hospitable neighbours Mr. and Mrs. C. McPhee.

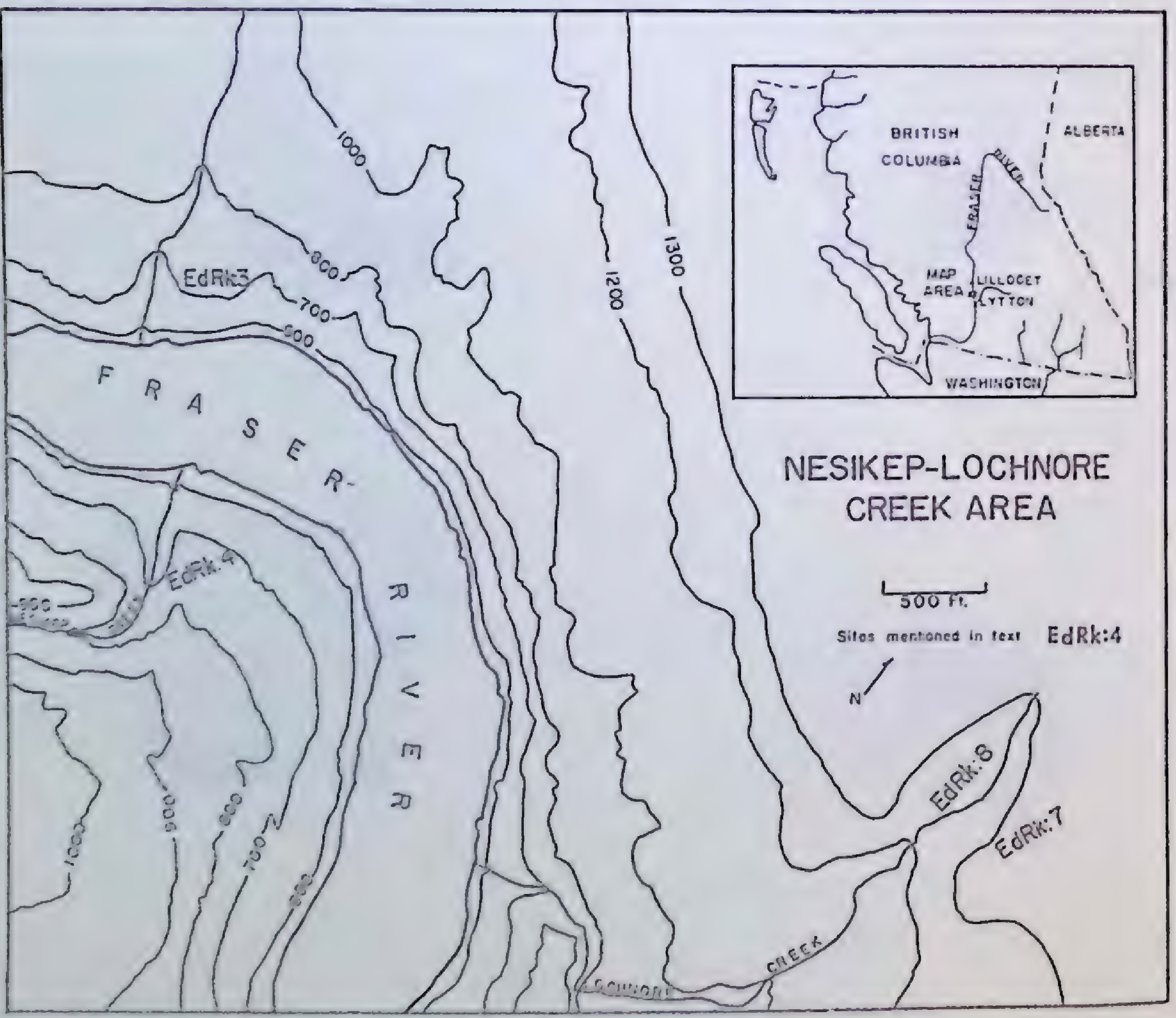

Figure 1. Map of the Nesikep-Lochnore Creek Area of South-Central British Columbia

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The Nesikep Creek site (EdRk:4) was first brought to our attention in the spring of 1961 while excavating two burials at EdRk:3, almost directly opposite Nesikep Creek on the left bank of the Fraser (Figure 1). A lifetime resident of the area pointed over to EdRk:4 and mentioned that the local Indians knew it to be a burial ground. Some months later, while I was engaged for the National Museum of Canada in a burial site survey of the west bank of the Fraser (Sanger 1961), Mr. McPhee, who farms the terrace above Nesikep Creek, showed me the 'Indian cemetery.' He indicated where he had found human skeletal material and pointed to locations where a friend and his son had unearthed several graves. An examination of the areas indicated by McPhee revealed scattered human long bones and cranial fragments. Although these spots were obviously disturbed, adjacent areas supported sagebrush, cactus, and small pine, giving every indication of being undisturbed. Excavations in 1962 revealed that beneath the cover extensive pothunting had in fact occurred. We recovered many fragments of skeletal material, some of it bleached by exposure, and some in relatively good condition. The older disturbed areas were probably covered over with duning sand, after which time the flora took root. Conversations with local residents established that after twenty years of lying fallow, a once cultivated field can degenerate to the tangle of sagebrush and cactus that covered portions of EdRk:4. In ordinary circumstances, more extensive test-pitting would have been undertaken in 1961, but because the site is in full view of a farmer who only a few months previous had tried to sell us his collection, and because in the previous winter (1961) another rancher had sold his collection and 'digging rights' to a local museum for $1,000, I was hesitant to advertise the presence of the Nesikep Creek site by test-pitting to any extent. The few pits dug in 1961 were encouraging; we uncovered artifacts and a fragment of charred cedar bark suggestive of planks from a cist-type burial known from the Plateau.

During our test-pitting in July 1962, we frequently encountered occupation horizons with varied cultural material, and rather than move to another site when we failed to contact undisturbed burials, we elected to concentrate in one area of the site in order to determine the extent and nature of the stratigraphy.

THE SITE

The site is presently about 200 feet above the summer flood of the Fraser River and affords an excellent viewpoint. The many good salmon-fishing rocks in the river below and the presence of deer on the higher slopes were probably ample attractions to the locale, especially in the summer when the constant breeze would facilitate fish drying. The same wind, however, would prove a deterrent to winter dwelling, as there is practically no shelter on the exposed site.

The geological deposits at EdRk:4 are composed of sand in varying colours and textures, most of it, if not all, blown in. Beneath the sands is a bed of unsorted angular gravel whose bedding plane, as seen in the profile exposed by the creek, suggests a fan deposit brought down from the mountains by Nesikep Creek. The dimensions of the site, as determined by test-pitting, are at least 100 by 70 metres, encompassing most of the entire sandy terrace. Large sections of the site remain unexcavated. Flora on the site includes northern black cottonwood (*Populus trichocarpa*), pine (*Pinus ponderosa*), Douglas spruce (*Pseudotsuga taxifolia*), wild rose (*Rosa* sp.), sagebrush (*Artemisia tridentata*), rabbit brush (*Chrysothamnus nauseosus*), pasture wormwood (*Artemisia frigida*), and cactus (*Opuntia fragilis*). The above species are common throughout most of the site; however, the northwest quadrant is blown-out and is almost devoid of cover except for a few isolated clumps of sage.

In ethnographic times the area was inhabited by Interior Salish speaking the Thompson language, and there are several recent-looking pit house depressions in the vicinity which may be attributable to the Thompson (Teit, 1900).

EXCAVATIONS

Two months were spent at Nesikep Creek. The first month was taken up with test-pitting and searching for burials. During this time, several of the cultural horizons described below were recognized, and in the second month, August, it was decided to concentrate in an area which promised to yield the best stratigraphic record.

Excavations were controlled by a grid system laid out in metric measurements. Most of the 1,000 artifacts recovered came from the area excavated in August (Pit B), a rectangular pit in the northeast quadrant measuring 5.5 by 5.0 metres and ranging from 1.5 to 4 metres in depth. Within this area the deposits were both level-stripped and dug by arbitrary 5 cm levels, the latter method being utilized primarily in deep pits and in zones thick enough to detect any indication of vertical change in artifact frequency or type. Material was removed with pointed mason's trowels and then screened. Smaller implements, such as brushes and dental tools, were frequently employed to secure delicate faunal remains and fragile artifacts. Profiles were drawn at one metre intervals, or more frequently when considered necessary.

The various components at Nesikep Creek have been assigned arbitrary zone numbers from top to bottom. Only cultural horizons have been included; a complete description of the many sterile levels would exceed the scope of this report. Eight zones are recognized; they are described below, together with some of the more diagnostic artifacts, from the most recent to the oldest. In addition to those artifacts which can be definitely assigned to a zone, there are several of doubtful affiliation. A few of these occurred in intermediate strata between zones; others were encountered

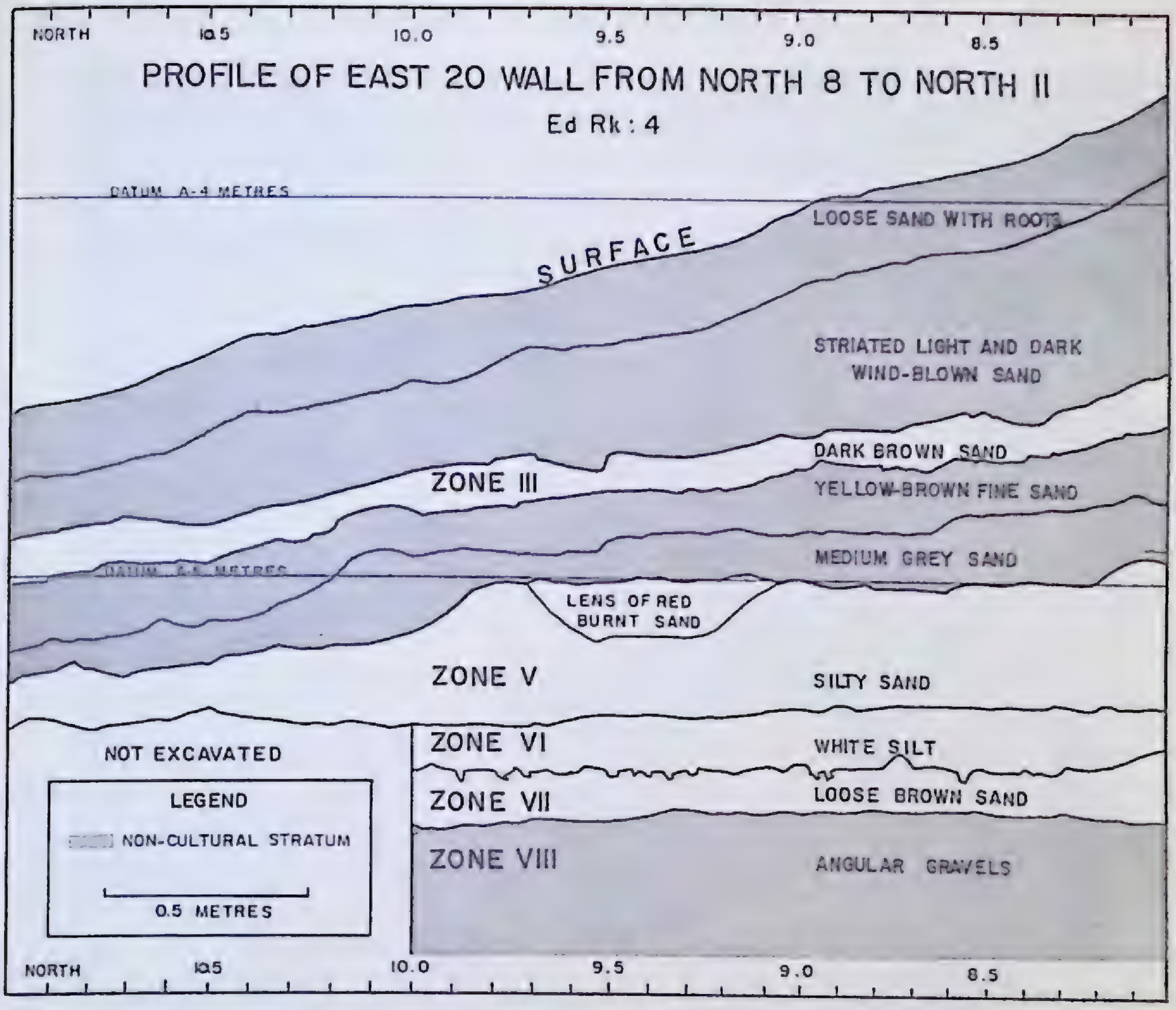


FIGURE 2. Profile of East 20 Wall from North 8 to North 11

when excavating outside Pit B but at depths suggesting correspondence with the earlier zones—V to VIII. One artifact of particular interest is a percussion flaked bi-point about 10 cm in length. It was excavated from a stratum 1.86 metres below the surface and was patinated similarly to objects of Zone V (*see* below).

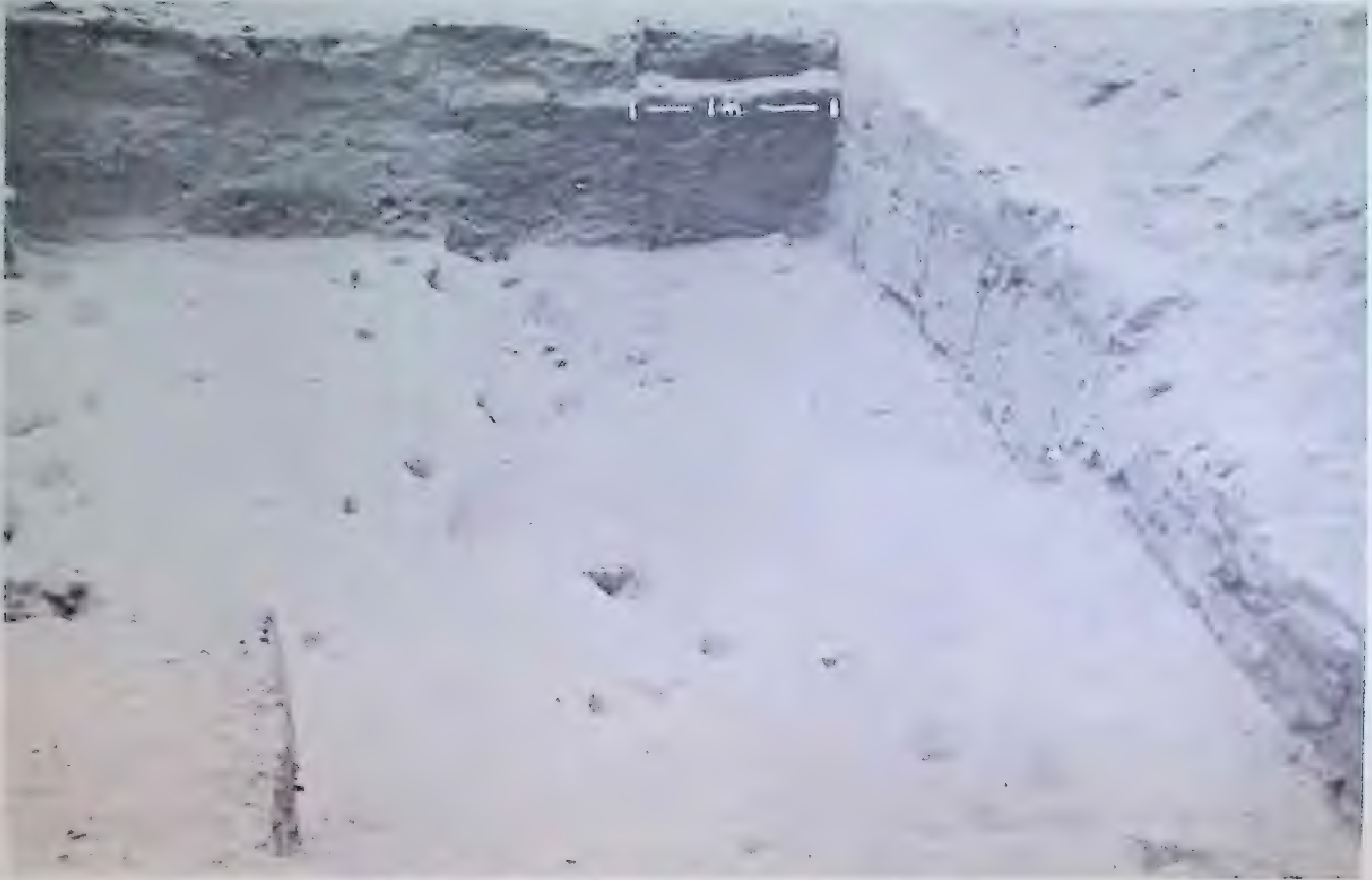
DESCRIPTION OF ZONES

Zone I (Plate II)

Restricted to the extreme southern end of the site, this thin and scarcely buried component is probably very recent. No signs of habitation pits are evident, and the shallow spreads of fire-cracked rocks suggest temporary encampment. Possibly the horizon represents a fall hunting camp, for many deer bones (*Hemionus*) were present.

Only thirty artifacts were recovered from Zone I. The objects include four chipped points, flake knives and scrapers, hammerstones, a shallow stone mortar, an obsidian tinkler (?), a clam shell pendant, a bone awl, and some charred birch-bark rolls. Below is a description of the chipped points from Zone I. All measurements are in centimetres.

PLATE I



Zone VI—The White Silt Deposit, Looking West

Catalogue Number—EdRk:4—90; Plate II, F

Length 3.0, width 1.7; thickness 0.4.

Made of basalt; essentially pentagonal in outline with straight edges and a straight base; lenticular in cross-section.

Flaking is irregular and is confined mainly to the distal portion; no pronounced basal thinning and no grinding.

Catalogue Number—EdRk:4—84; Plate II, E

Length 1.4; width 0.9; thickness 0.2.

Made of a white cryptocrystalline material; small triangular side-notched point with straight edges and a concave base; notches are placed more than half-way up from the proximal end; plano-convex in cross-section.

Flaking irregular and limited; a few small basal flakes removed from one face only.

Catalogue Number—EdRk:4—81; Plate II, H

Length 5.5; width 2.4; thickness 0.7.

Made of basalt; essentially leaf-shaped, tending to asymmetry; straight base; plano-convex in cross-section.

Flaking irregular; no basal thinning.

Catalogue Number—EdRk:4—80; Plate II, G

Length 5.0; width 2.0; thickness 0.6.

Made of basalt; asymmetric with one convex edge and one concave edge with a shoulder; straight base; almost diamond-shaped in cross-section.

Flaking irregular and limited mainly to the edges and the base; base thinned by the removal of longitudinal flakes.

Zone II

Nothing is known of this horizon except that it contained human burials and that, stratigraphically, it underlies Zone I in the southern portion of the site. Disturbed and disarticulated skeletal material was found in many of our test pits, and it seems likely that the main concentration was in a strip 30 metres wide and running the length of the site on the north-south axis.

Zone III (Plate III)

The uppermost cultural horizon in Pit B, Zone III, is the most extensive component at EdRk:4, showing as a dark brown seam in practically every test pit. The deposits are thicker in the northwest quadrant and progressively thinner toward the extremities of the site. In Pit B, Zone III averages 10 to 15 cm in thickness. The stratum appears fairly even with the exception of some storage pits. No positive evidence of house pits was observed. This apparent absence of a house-pit settlement pattern may indicate a summer camping site. Other evidence for this seasonal occupation includes a substantial midden of salmon bones as well as antler in the velvet.

In addition to the 169 artifacts recovered in excavation, we were able to determine by means of a long slit trench from Pit B that most, if not all, of the surface collection from the blown-out southwest quadrant represents Zone III. Combining the artifacts from the surface with those excavated, the total number from Zone III amounts to 470 specimens. The component is characterized by non-patinated vitreous basalt chipped artifacts in a number of distinctive forms, including medium to large side-notched triangular points, stemmed points, drills, microblades, plano-convex end scrapers, and flake side scrapers. Other stone implements include small polished jade fragments (adz blades?), whetstones, hammerstones, small cobble choppers, large quartzite scrapers, and shallow mortars. Organic artifacts include a modified *Olivella* shell, bone awls, an antler wedge, an antler flaker, and an antler pendant. Notable features in this component include bark- and rock-lined storage pits. Several samples of charcoal were gathered.

Seven complete points are described below. These were all recovered from excavation, and their association is certain. Fragments of points essentially similar in outline were collected from the surface; however, no complete specimens were found owing to the activities of the local Indians who habitually pick up all points to sell in Lillooet. All measurements are in centimetres.

Catalogue Number—EdRk:4—496; Plate III, M

Length 5.3; width (at base) 1.6; thickness 0.5.

Made of basalt; triangular side-notched point with straight edges and a straight base; plano-convex in cross-section.

Flaking irregular on one face and tends to collateral on the other; base thinned by the removal of thin longitudinal flakes; no basal grinding.

Catalogue Number—EdRk:4—535; Plate III, N

Length 4.6; width (above notches) 1.7; thickness 0.3.

Made of basalt; triangular side-notched point with convex edges and straight base; plano-convex in cross-section.

Flaking irregular to collateral; base thinned by the removal of small longitudinal flakes; no basal grinding.

In addition to these two side-notched points, there are two basal fragments which are wider than the two specimens described above and may be fragments of correspondingly larger points.

Catalogue Number—EdRk:4—117; Plate III, O

Length 4.3; width 1.6; thickness 0.6.

Made of basalt; leaf-shaped and slightly asymmetrical with a straight base; plano-convex in cross-section.

Flaking irregular; no basal thinning or grinding.

Catalogue Number—EdRk:4—709; Plate III, P

Length 4.8, width (at shoulders) 2.7; thickness 0.6

Made of basalt; triangular blade with convex edges; gently contracting stem with sloping shoulders; base of stem incomplete; thick and lenticular in cross-section.

Flaking irregular and shallow; stem thinned by horizontal flakes; no evidence of basal grinding.

Catalogue Number—EdRk:4—40; Plate III, Q

Length 3.4; width (at shoulders) 2.0; thickness 0.5.

Made of basalt; stemmed point with triangular blade with pronounced shoulders and broken narrow stem (probably parallel); plano-convex in cross-section.

Flaking irregular; no basal grinding or thinning.

Catalogue Number—EdRk:4—687; Plate III, R

Length 2.3; width 1.6; thickness 0.5.

Made of basalt; triangular blade with an expanding indented stem; shouldered; thick in cross-section and lenticular.

Flaking irregular; base thinned by removal of small longitudinal flakes, some intentionally stopped; base and edges of the stem ground smooth.

Catalogue Number—EdRk:4—129 and 126 (two matching fragments); Plate III, S

Length 2.4; width 1.9; thickness 0.3.

Made of basalt; side-notched triangular point with straight edges and a concave base; lenticular in cross-section.

Flaking irregular; some basal thinning by the removal of small longitudinal flakes; no basal grinding.

Zone IV (Plate IV)

This component is known only from the area excavated in August (Pit B) and is confined to the southernmost two metres of the pit. The stratum is overlain by Zone III but is intrusive into Zones V, VI, and VII, in the form of a large pit, of which only a corner extends into the excavated area. There is a suggestion that this intrusion may be the corner of a house pit; however, this must be confirmed by future excavation.

Zone IV is distinguished from the other zones by the matrix and the cultural assemblage: The grey sand is distinctive, as is the high percentage of microblades. In this small assemblage, 29 of the 63 artifacts are microblades. Twelve of these are truncated prisms. One possible exhausted core was recovered (Plate IV, E). Three basal fragments of projectile points were excavated from Zone IV. They are described below with all measurements in centimetres.

Catalogue Number—EdRk:4—712; Plate IV, K

Length 2.6; width (at break) 2.4 (at base) 1.7; thickness 0.5.

Made of basalt; basal portion of a large side-notched point, possibly with convex edges; edge serrated; lenticular and thin in cross-section.

Flaking shallow, conchoidal and parallel; base thinned by longitudinal flakes intentionally stopped just above the notches; no basal grinding.

Catalogue Number—EdRk:4—708; Plate IV, L

Length 3.4; width (at shoulders) 2.1 (at base) 1.9; thickness 0.4.

Made of basalt; basal portion of a long stemmed point produced by corner notching; blade edges parallel and serrated; stem expanding with a slightly concave base; lenticular and very thin in cross-section.

Flaking shallow and generally irregular, sometimes transverse and parallel; stem thinned by the removal of longitudinal flakes intentionally stopped above the shoulders; some grinding on the basal and lateral edges of the stem.

Catalogue Number—EdRk:4—978; Plate IV, M

Length 3.8; width (at shoulders) 2.1 (at base) 1.6; thickness 0.5.

Made of basalt; basal portion of a long stemmed point produced by corner notching; blade edges parallel and serrated with barbs; stem expanding with a straight base; lenticular in cross-section and very thin.

Flaking shallow practically collateral; stem thinned by removal of intentionally stopped longitudinal flakes; no basal grinding.

Zone V (Plate V)

Considering yield per cubic metre excavated, Zone V was the most productive horizon, with 310 specimens recovered from Pit B. A few artifacts, described earlier as not being positively assignable to a specific zone, are almost certainly of comparable age. Like the specimens from Zone IV, many were encrusted with a distinctive white patination, a coating apparently the result of contact with the white silts of Zone VI, discussed below.

Separated from Zone III by a sterile layer, Zone V, which averages 10 to 20 cm in thickness, is composed of a white silty sand which increases both in silt content and compactness with depth. Arbitrary 5 cm levels were employed within this component, and a definite change in artifact frequency was noted; the levels increased in productiveness to a climax, and then markedly diminished in the last 5 cm level of the horizon. It is possible that a more detailed analysis of the level bags and the stratigraphy will indicate slight changes in artifact forms within Zone V.

The artifacts from Zone V are distinctive from all other zones. Very few cryptocrystallines were employed, and the veinous light grey basalt, which characterizes the stone specimens from Zone V, is not present in other components. This, combined with the peculiar white patination mentioned above, the small distinctive projectile points and knives, and the total absence of microblades, sharply delineates Zone V from the other components. No charcoal was encountered in Zone V, although some areas of burned sand (*see* Plate I) were noted.

Seven points are described; all measurements are in centimetres. A number of other point fragments were found, but they illustrate no diagnostic tendency except for two undescribed fragments with parallel diagonal ripple flaking.

Catalogue Number—EdRk:4—613; Plate V, N

Length 1.2; width (at shoulders) 1.8; thickness 0.3.

Made of basalt; basal fragment of a stemmed point with pronounced shoulders; stem slightly expanding with a straight base formed by deep corner notches; lenticular and thin in cross-section.

Flaking probably irregular; some basal thinning but no grinding.

Catalogue Number—EdRk:4—812; Plate V, O

Length 2.6; width (at shoulders) 1.3; thickness 0.3.

Made of basalt; triangular blade with straight edges; shouldered, with narrow parallel stem; straight base; plano-convex and thin in cross-section.

Flaking irregular, on one face only; no basal thinning or grinding.

Catalogue Number—EdRk:4—642; Plate V, P

Length 3.6; width 1.4; thickness 0.3.

Made of basalt; triangular blade with convex edges; slight stem with sloping shoulders; slightly concave base; lenticular in cross-section.

Flaking at a minimum and directed mainly to producing a cutting edge; small flakes removed for basal thinning from one face only; no basal grinding.

Catalogue Number—EdRk:4—638; Plate V, Q

Length 3.8; width (at shoulders) 2.8 (at stem) 1.3; thickness 0.5.

Made of basalt; broad triangular blade with convex edges; sloping shoulders and narrow parallel-sided stem with straight base; moderately thick and lenticular in cross-section.

Flaking irregular; no thinning or grinding of base.

Catalogue Number—EdRk:4—464; Plate V, R

Length 4.1; width (at shoulders) 2.3; thickness 0.3.

Made of basalt; triangular blade with convex serrated edges; slight shoulders; stem expanding and base concave; lenticular and thin in cross-section.

Flaking irregular; stem thinned by small longitudinal flakes; lateral edges ground.

Catalogue Number—EdRk:4—711; Plate V, S

Length 3.9; width (at shoulders) 2.1; thickness 0.5.

Made of basalt; blade triangular and asymmetric with one convex edge and one straight edge; weak shoulders and a broad contracting stem with a rounded base; lenticular in cross-section.

Flaking irregular with no basal thinning or grinding.

Catalogue Number—EdRk:4—531; Plate V, T

Length 4.3; width (at base) 1.9; thickness 0.5.

Made of basalt; asymmetric triangular point with a slight constriction in each edge; straight base; plano-convex in cross-section.

Flaking diagonal and transverse; base thinned by intentionally stopped longitudinal flakes on one face, and by normally detached longitudinal flakes on the other; no basal grinding.

Zone VI (Plate I)

As the deepest portions of Zone V become progressively less productive, the silty sand merges into a very compact white silt deposit, labelled Zone VI. The origin of the silt layer is not clear; alternate suggestions include: a) a fluvial deposit, b) a man-made 'floor,' c) volcanic ash, d) an aeolian deposit. Until a geologist can examine the stratum in the field, and until microscopic analysis of a sample can be undertaken, any conclusions as to origin must remain tentative. However, the distribution of the stratum in other areas of the site, and the presence of charcoal, bone, and stone artifacts in the silt matrix, suggest the silts might have been blown in.

Very few artifacts were noted in Zone VI, but two features are of great interest. The first is the presence of many moulds of post holes dug in from the younger deposits above. After Zone V was stripped and Zone VI exposed, the post moulds were excavated and recorded. In the main, no apparent pattern emerged; however, in the northern end of the stratum a series of post moulds, larger than other surrounding moulds, was arranged in a distinct semi-circular pattern, roughly following the edge of a large pit extending from Zone III through Zone VI and into the gravels below. There may be some relationship between these post holes and the pit, although the significance of the correspondence is not known.

The second feature of note is the presence of finger-like projections of silt (generally 5 cm long and 2 to 3 cm in diameter) extending down below the main level of Zone VI and into the sands of Zone VII (*see* Figure 2). Excavation of Zone VII shed light upon the origin of some of these 'fingers.'

Zone VII (Plate VI)

The earliest undeniably cultural horizon, and perhaps the most intriguing, is Zone VII. Directly underlying the silts of Zone VI, the matrix of Zone VII is composed of a medium-textured, loosely compacted brown sand, which increases in gravel content with depth. Most of the cultural material is confined to a 10 cm level just under Zone VI, and in some instances the silts of this horizon have blanketed artifacts which would have been on the surface at the time of deposition. The outstanding degree of preservation of the faunal remains and organic artifacts from Zone VII may in large part be due to the sealing effect of the Zone VI silts, a cap which was quite possibly deposited either during occupation of Zone VII, or within a season or two after abandonment. The high alkali content of the sands, witnessed in the thick carbonate deposit on all the artifacts, may also be instrumental in the preservation of the organic remains.

When Zone VII had been almost completely excavated, two post moulds were noted in the western end of the horizon. As these holes were beside a pit dug from Zone V and into Zone VII, we immediately scraped clear an area under which there should have been a post hole if the pattern noted in Zone VI (*see* above) was recurrent. We located a post mould and, continuing around the edge of the pit until the limit of the excavations, we discovered six holes arranged in a pattern similar to that described above. It will undoubtedly be necessary to excavate completely the intrusive pits in order to explain satisfactorily the post moulds and their relation to the pits. Possibly the posts were connected with a superstructure.

The nature of the finger-like projection from Zone VI became apparent as Zone VII was excavated. In the process of exposing a hearth, a series of projections was noted completely encircling the feature. The presence of the silt fingers around the hearth, but not in it, suggests the habit of broiling food upon stakes thrust into the sand beside a fire.

Diagnostic of Zone VII is the presence of chipped points typologically very similar to Scottsbluff, Milnesand, and Plainview, in direct association with microblades and a possible exhausted polyhedral core. Other artifacts include a microblade with retouched edges and suggestions of hafting as an end blade (Plate VI, F), red and yellow ochre, many plano-convex end scrapers, cobble choppers, a symmetrically bevelled antler wedge, ground marmot tooth incisor graving tools, a long antler point, a possible polished bone needle, hammerstones, bone beaming tools, large strongly recurved chipped points, triangular points, and a large leaf-shaped knife. No burins or burin spalls were found. Noteworthy was the discovery of a bag or cache find containing four points (Plate VI: V, W, Y, Z), red ochre, marmot teeth, an antler point, a possible bone needle, scrapers, and miscellaneous bird bones.

As a result of aboriginal pits originating from the upper horizons (*see* Plate I), Zone VII was not so extensive as some of the other components; nevertheless, 120 artifacts, many pieces of chipping detritus, and abundant faunal remains were recovered. A number of small charcoal samples were gathered, and it is hoped that they can be tested for a radiocarbon age determination. Nine points and diagnostic fragments are described below. All measurements are in centimetres.

Catalogue Number—EdRk:4—716; Plate VI, K

Length 3.5; width 2.3; thickness 0.3.

Made of basalt; triangular point with convex edges and a straight base; lenticular in cross-section and very thin.

Flaking irregular and limited; a little basal thinning but no grinding.

Catalogue Number—EdRk:4—715; Plate VI, R

Length 4.3; width 2.6; thickness 0.4.

Made of basalt; triangular point with straight edges; two very shallow side notches half-way up the blade; straight base; lenticular and very thin in cross-section.

Flaking irregular; base thinned by broad, intentionally stopped longitudinal flakes; high spots along the edges of the blade ground smooth, side notches smoothed.

Catalogue Number—EdRk:4—713; Plate VI, S

Length 3.6; width 2.9; thickness 0.4.

Made of basalt; basal fragment of a large parallel-sided point with concave base; lenticular and thin in cross-section.

Flaking irregular; base thinned by removal of several intentionally stopped longitudinal flakes; no basal grinding.

Catalogue Number—EdRk:4—714; Plate VI, T

Length 2.1; width 2.3; thickness 0.3.

Made of basalt; basal fragment of possibly a parallel-sided point; the base slightly convex; lenticular and thin in cross-section.

Flaking irregular; base thinned by the removal of a series of short longitudinal flakes; no basal grinding.

Catalogue Number—EdRk:4—710; Plate VI, U

Length 6.0; width 1.9; thickness 0.4.

Made of basalt; parallel-sided point with margins curving sharply at the tip; base slightly convex; lenticular and thin in cross-section.

Flaking both irregular and collateral, tending to diagonal flaking from left to right; base thinned by a series of intentionally stopped longitudinal flakes on both faces; some grinding on the lateral edges near the base.

Catalogue Number—EdRk:4—955; Plate VI, V

Length 4.9; width 2.5; thickness 0.3.

Made of basalt; stemmed point with broad triangular blade with convex edges; stem damaged, originally it would have been more nearly symmetrical, expanding and straight based; lenticular and thin in cross-section.

Flaking irregular and confined mainly to the edges of the blade; no basal thinning or grinding. The mould of a possible needle fragment (EdRk:4—966) still adheres to the blade.

Catalogue Number—EdRk:4—953; Plate VI, W

Length 6.2; width (at shoulders) 2.4 (at base) 1.8; thickness 0.4; length of stem 0.7.

Made of basalt; stemmed and shouldered point with a triangular blade; stem broad and expanding with slightly concave base; lenticular and thin in cross-section.

Flaking both transverse and collateral with some tendency to diagonal from left to right; stem thinned by the removal of several longitudinal flakes from both faces; the lateral and basal edges of the stem ground smooth.

Catalogue Number—EdRk:4—954; Plate VI, Y

Length 8.3; width 3.0; thickness 0.4; length of stem 0.7; width of stem 1.3.

Made of basalt; strongly recurved lanceolate point with deep basal notches producing long barbs; tendency toward serration on the blade edges just above the barbs; stem parallel-sided with a slightly concave base; lenticular and very thin in cross-section.

Flaking transverse at the distal end, changing to diagonal collateral at the proximal end; stem thinned by intentionally stopped longitudinal flakes terminating just above the notches; lateral edges of the stem exhibit some grinding.

There are two points of this form, the second being somewhat smaller.

Catalogue Number—EdRk:4—952; Plate VI, Z

Length 13.0; width 4.5; thickness 0.7–1.0.

Made of basalt; large leaf-shaped point with a rounded base; lenticular and thick in cross-section.

Flaking irregular; no attempt at basal thinning; some grinding of the lateral edges approximately one-third up the length of the artifact.

Zone VIII

At present, it is not possible to say definitely whether or not the gravels underlying Zone VII contain any cultural material. Towards the close of the excavation a single 50 by 50 cm test pit was hastily dug to a depth of 50 cm into the gravels. At 50 cm, a piece of water-worn basalt with dubious flake scars along one edge was encountered. A larger sampling of the gravels will be necessary before any concrete statements can be made regarding the cultural position of Zone VIII.

DISCUSSION

A cursory examination of the various assemblages from Nesikep Creek suggests that of the two cultural processes, stability and change, the latter is more apparent. The most striking change is quite naturally in chipped point forms. In the earliest cultural horizon, Zone VII, a number of points resemble, both in outline and manufacturing technique, the Scottsbluff, Plainview, and Milnesand points of the Plains. A similarity between the Zone VII assemblage and that of Zone V is to be seen in the occasional examples of parallel diagonal flaking in the more recent horizon, but the points from Zone V are smaller and are generally stemmed. The expanding stemmed points from Zone IV are very unlike the examples from Zone V and have their closest typological analogues in the stemmed points from Zone VII. In Zone III, the side-notched forms appear, though some stemmed points persist, and a small asymmetric leaf-shape is introduced. The most recent horizon, Zone I, features the diminutive side-notched triangular point, the small asymmetrical leaf shape first seen in Zone III, and the pentagonal points.

Microblades occur in three of the assemblages. They are present in Zone VII, are absent in Zone V, reappear in force in Zone IV, and greatly diminish in numbers in Zone III. By Zone I time, they are not present. The absence of any microblades, or even parallel-sided flakes, from the relatively extensive Zone V is probably significant, while their absence from Zone I is a reflection of the ethnographic situation.

In Zone VII there are numerous examples of dorsally truncated, plano-convex end scrapers, of both round and ovoid types. A few are found in Zone V, but in the succeeding horizons they disappear almost completely. Corresponding with the decrease in plano-convex scrapers is the increase in the use of flake side scrapers.

The various succeeding inhabitants of Nesikep Creek exploited a number of different quarries for their lithic materials. In Zone VII, the most commonly used rock was a fine-grained black basalt with the grains visible to the naked eye, whereas that employed in Zone V was a finer-grained grey basalt with darker-coloured veins running through the rock. The basalt objects from Zone IV were made of a black basalt not unlike that found in Zone VII, while in Zones III and I, a shiny vitreous basalt was most commonly used. Various types of impure quartz such as chalcedony and jasper were employed sparingly. These cryptocrystallines occurred most frequently in Zones VII and III, and scarcely at all in Zone V. Another change in lithic working technique was the introduction of stone grinding in Zone III in the form of ground and polished nephrite fragments, possibly adz blades.

An examination of artifact types indicating cultural stability brings to the fore an unresolved problem of longstanding duration in Northwest Coast prehistory—that of Coastal-Interior relationships. From our excavations at Nesikep Creek we are now able to say that at least two artifact forms, known historically to have been woodworking tools, were in evidence as early as Zone VII. The antler wedge (Plate VII, F) and the ground rodent-incisor carving tools found in our earliest component were still employed in ethnographic times (Teit, 1900: 183). Considering the first millennium dates for woodworking tools in the Fraser Delta (Borden, 1950: 19; McCallum and Dyck, 1960: 77), the suggestion of woodworking in the earliest levels at Nesikep Creek may be of importance in determining the direction of cultural flow between the Coast and the Interior.

Equally pertinent to the overall problem of determining the local developmental sequence is the presence of ground antler, bone, and tooth in the early levels, while ground stone does not make an appearance until Zone III in the form of polished nephrite. Again, considering the first millennium dates for ground stone tools in the Fraser Delta, it seems possible that stone grinding techniques on slate and nephrite may be somewhat older to the south of the Nesikep Creek region and downstream from there.

Other evidence for cultural stability at EdRk:4 involves the ubiquitous bone awls, cobble choppers, and flake scrapers. In addition, certain environmental factors evidently fostered recurrent patterns of food utilization, since fish remains, probably salmon, were encountered in all levels. However, there are certain differences from zone to zone. In the lowest level, the faunal remains are predominantly deer, while in Zone III solid middens of fish remains were noted. Although to some extent the greater antiquity of the lower horizons could tend to introduce a selective factor in that the more fragile fish bones would be among the first to deteriorate, the presence of small bones (mice and small birds) suggests that this variable can probably be discounted. Thus, an increasing exploitation of the river resources in the form of salmon may be indicated, although other factors, such as seasonal encampment, may have played a part.

For comparative assemblages one has to stray so far afield that only the most tenuous kinds of statements can be offered. Nothing approaching the assemblage from Zone VII has ever been reported from excavated sites along the Columbia River. The reports of the so-called 'Paleo-Indian' points in the Columbia Plateau have all been scattered surface finds, and with the exception of occasional finds on the peripheries of the Plateau (Butler, 1963), none have been found in controlled excavation. Microblades are sharply restricted in the Plateau, and although they have been noted in the American Plateau, most of our knowledge is from the Canadian sites. Microblades have been reported from Natalkuz Lake in central British Columbia (Borden, 1952) and from DjRi:3 in the Fraser Canyon (Borden, 1961), where C 14 dates of 2415±160 B.P. and 2360±60 B.P. respectively, have been determined. Neither of these sites contains the Plano-like points however, and in order to find other sites with this association it is necessary to turn toward northern Canada, in particular to MacNeish's Callison report (1960).

Though there may be some suggestions of an assemblage similar to Zone IV in central Washington (*see* below), the microblades once again point to northern affiliations. Zone V is unique in the Plateau. The emergence of side-notched triangular points in Zone III makes this assemblage more readily comparable with other Plateau collections, although the limited amount of excavation in the Canadian Plateau sharply limits any comparisons. However, Zone III does provide an excellent base for ethnographic assemblages. The ethnographic-like character of Zone I is reasonably clear. It apparently represents a relatively undifferentiated complex of traits recognized throughout much of south-central British Columbia.

The lack of adequate comparative data and the scarcity of C 14 dates render it practically impossible to use a comparative method for dating the sequence at Nesikep Creek. As mentioned above, a late prehistoric date from Zone I seems fairly well established. Zone III is more difficult to date. One worker has suggested that the large side-notched point be considered a time-marker in the Plateau (Gruhn, 1961: 130). One of the two medium to large side-notched triangular points illustrated from Zone III (Plate III, M) is larger than any point Gruhn describes, and some basal fragments from Zone III are larger than any of the bases of the complete points shown in Plate III. Neither the specimens from Idaho (Gruhn, 1961) nor the points from Nesikep Creek are so massive as the triangular points recovered from along the Columbia River, which may indeed have some antiquity. It does not, therefore, appear reasonable at this time to assume too great an antiquity for the triangular points from

Nesikep Creek, and a date of less than 2000 years seems plausible. Several excellent charcoal samples were recovered from Zone III, and a C 14 date determination would place the problems of— a) the age of the triangular points, b) the introduction of ground nephrite tools, and c) the apparent lessening in importance of microblades, in much sharper focus.

Because of the absence of any similar assemblages from other Plateau sites, a consideration of the antiquity of Zones IV and V must remain in abeyance, although a small assemblage from the Orondo Shelter in central Washington State (Gunkel, 1961: 162) may contain point forms reminiscent of those found in Zone IV. This stratum (Orondo Subphase I) is estimated to be about 2,000 years old (Gunkel, 1961: 152), a figure based on geological evidence. Considering the guess date of less than 2000 years for Zone III (*see* above), the date for Zone IV should probably be around 2000 B.P. Zone V, on the other hand, is very unlike other Plateau assemblages, and nothing more substantial than 'greater than' 2000 years can be afforded.

The presence of points reminiscent of the Plano tradition of the Plains should not be taken *a priori* as an indication of great age for Zone VII. Present evidence from the Arctic suggests that the association with microblades sets an age limit.

Certain artifact forms, in particular the large recurved points, do not appear to have originated from the north. An intensive, but not exhaustive, review of Plateau point types suggests no similarities, and it may be necessary to refer to the northern Plains and the Eastern Archaic forms to discover parallels. It is not my intention at this time to trace the increasing number of parallels in artifact forms between the East, the Plains, and the Pacific Northwest, but rather to point out that Zone VII at Nesikep Creek may represent a hybrid assemblage, a manifestation brought about by the welding of several distinct lines of development. There are several small samples of charcoal from Zone VII which should be dated if possible. A knowledge of the age of the earliest component at Nesikep Creek would contribute greatly to an understanding of the prehistory of south-central British Columbia.

The components at Nesikep Creek, together with collections from nearby sites, suggest a long and complex sequence of cultural development within a 5-mile stretch of the Fraser River from Texas Creek to Nesikep Creek. At Texas Creek (EdRk:1), a substantial number of burials were bulldozed in 1961. The large collection of burial inclusions which is now at the Kamloops Museum is similar to local ethnographic materials. In the spring of 1961 two burials were excavated at EdRk:3 (*see* Figure 1), a now destroyed site directly across the Fraser from Nesikep Creek. The collection from that site suggests affinities with both the Texas Creek site and with Zone III at Nesikep Creek, and perhaps it represents an intermediate period.

A series of components is emerging at EdRk:7 and EdRk:8, two stratified sites on Lochnore Creek (*see* Figure 1). The most distinctive artifacts from EdRk:8 are crudely made, thick-stemmed, indented base projectile points reminiscent of Pinto Basin points. According to the discoverer, the artifacts were dug up from a hard pan. The points are covered with a patination similar to that covering the artifacts from Zone V at Nesikep Creek, which in turn overlay the hard silts of Zone VI. A short distance away, at EdRk:7, large and deeply basally notched triangular points occur with microblades in a pithouse context.

The recent discovery of the Lochnore Creek sites and the emergence of certain problems from the Nesikep Creek excavations indicate that more work in the area would be highly desirable. One of the most intriguing problems concerns the relationship between Zones IV and VII at Nesikep Creek. Although these two components differ as to incidence of microblades and point forms, typologically some of the points are quite similar, and a historical connection is possible. Our excavations barely sampled Zone IV, and it would be important to acquire a larger assemblage for comparative purposes as well as some charcoal for radiocarbon dating. In addition, the stratigraphy suggests that Zone IV may represent the corner of a pithouse. Further excavation should clarify this.

Site EdRk:8, which yielded the Pinto Basin-like points, will be test-pitted this spring (1963) to check the association and to determine the stratigraphy. On the basis of the ensuing assessment, plans may be made for more work in the area, possibly in the summer of 1964.

RÉSUMÉ

Au cours de l'été de 1962, des fouilles archéologiques ont été exécutées au ruisseau Nesikep dans un site d'habitation et d'inhumation comprenant de multiples éléments et situé sur la rive droite du fleuve Fraser à 16 milles au sud de Lillooet, en Colombie-Britannique. Ces fouilles, commanditées par le Musée national du Canada en collaboration avec l'Université de la Colombie-Britannique, étaient sous la direction générale de M. C. E. Borden, de cette même université. En plus des sépultures qui ont été pillées par des collectionneurs de reliques, le site du ruisseau Nesikep renferme six niveaux distincts d'habitation s'échelonnant de la période ethnographique jusqu'à une période qui a donné des pointes Plano en forme de fer de lance, entremêlées de lamelles et de racloirs à pointe courte et plate. Les horizons intermédiaires révèlent une évolution des pointes en forme de fer de lance vers des projectiles à tige et finalement à entailles latérales dans les éléments constitutifs plus récents. Plus d'un millier d'objets ouvrés ont été récupérés.

On a constaté des filiations culturelles avec les cultures ethnographiques locales dans les éléments constitutifs les plus récents; l'horizon le plus

ancien est, selon toute apparence, originaire des plaines ou des régions subarctiques ou des deux. On a relevé quelques similitudes avec les objets trouvés sur le plateau américain. L'auteur est d'avis que les gisements remontent à l'époque ethnographique et au plus tard à l'an 2000 av. J.-C. On ne pourra fixer d'une façon absolue l'époque à laquelle remontent ces objets, qu'après des datations par la méthode du carbone 14.

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PLATE II

Selected Artifacts from Zone I

Figure A. Hammerstone
Figure B. Obsidian tinkler (?)
Figure C. Flake end and side scraper
Figure D. Hammerstone
Figure E. Triangular side-notched point
Figure F–H. Chipped points
Figure I. Flake side scraper
Figure J. Parallel-sided flake scraper

PLATE II

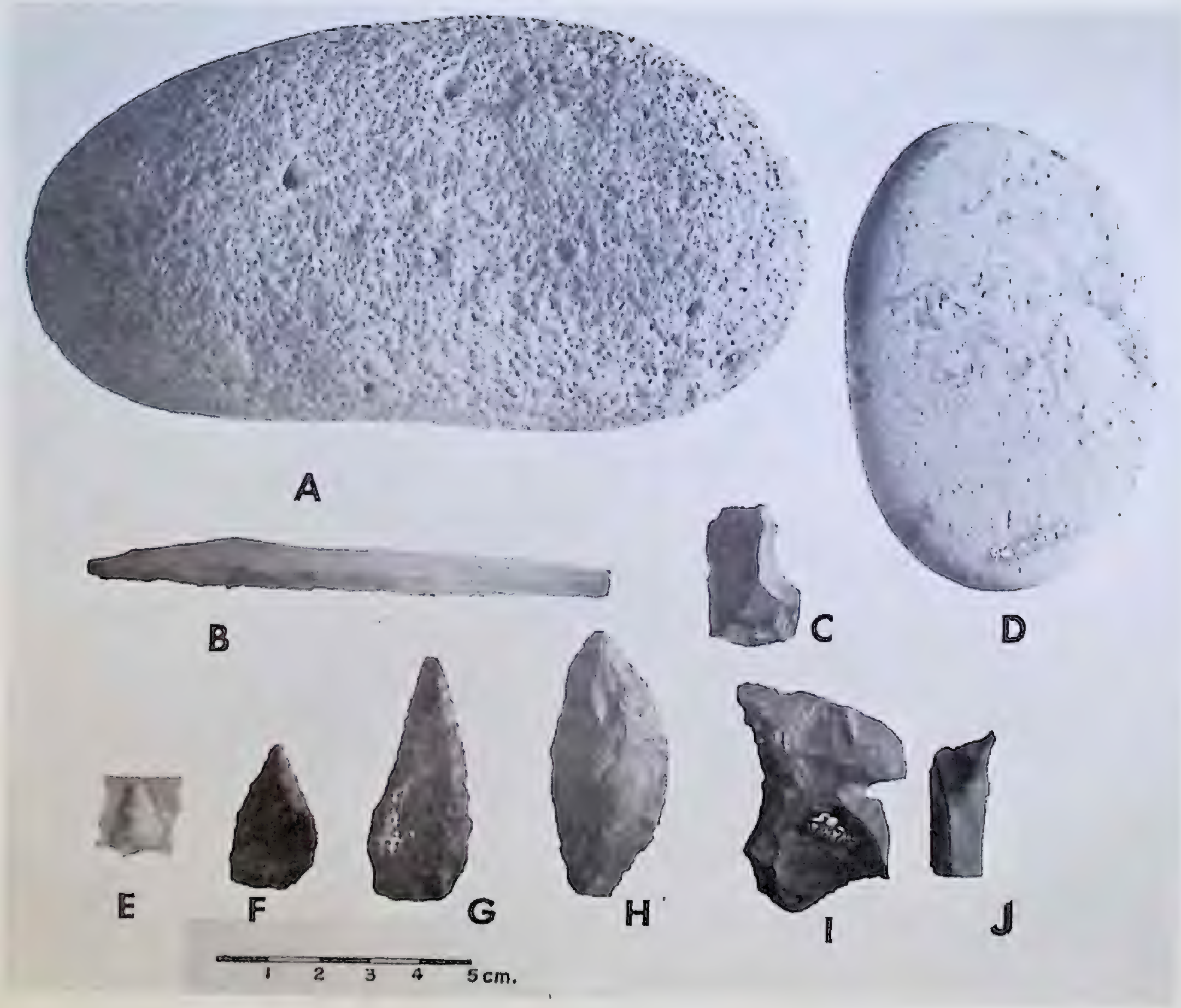


PLATE III

Selected Artifacts from Zone III

Figure A.	Sandstone abrasive stone
Figure B.	Core scraper
Figure C.	Hammerstone
Figure D.	Flake chopper
Figure E–H.	Microblades
Figure I–K.	Flake scrapers
Figure L.	Hammerstones
Figure M–S.	Chipped points
Figure T.	Hafted scraper
Figure U.	Drill
Figure V.	Knife fragment

PLATE III

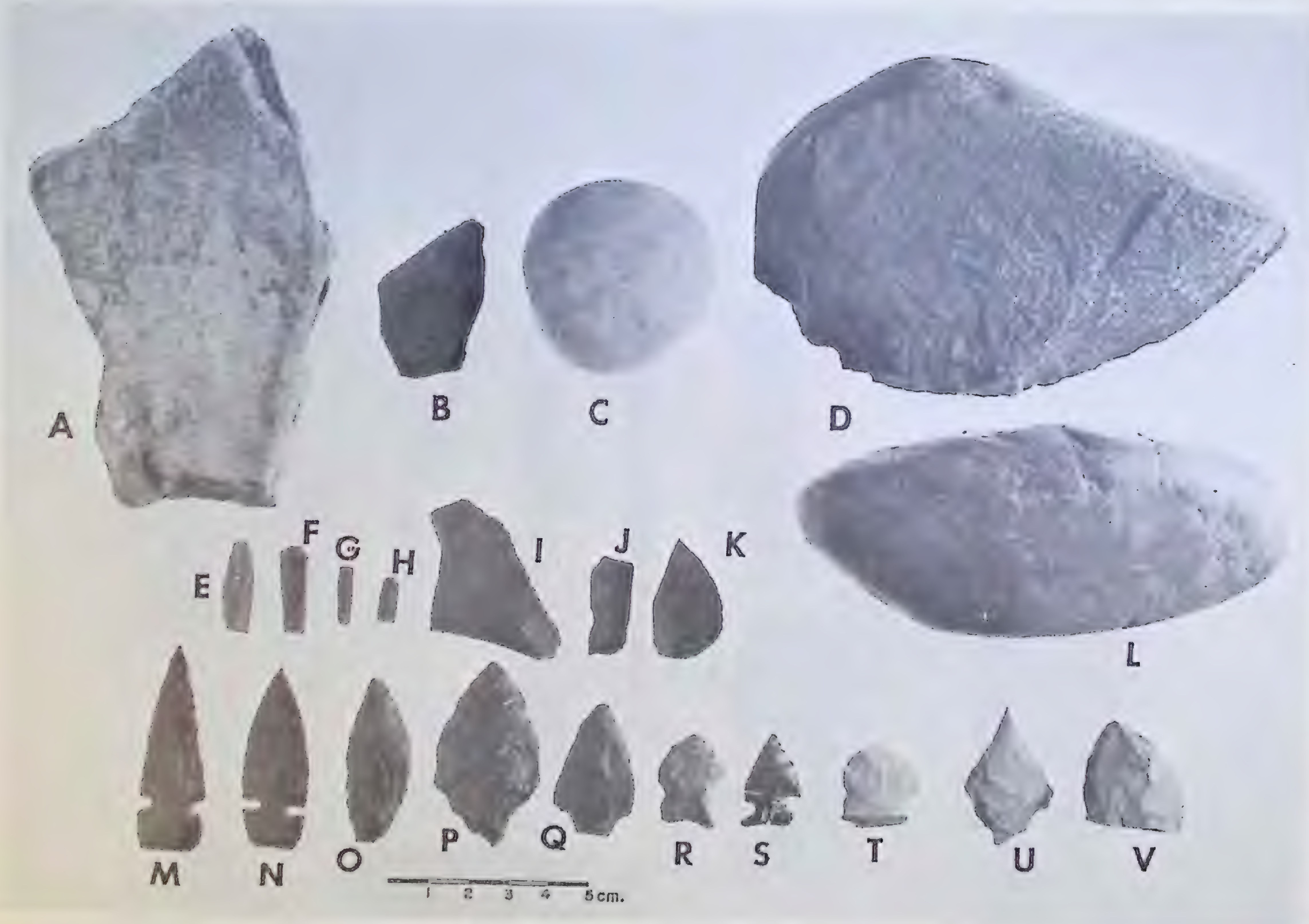


Plate IV

Selected Artifacts from Zone IV

Figure A. Flake scraper

Figure B–D. Microblades

Figure E. Core scraper

Figure F. Microblade core fragment (?)

Figure G–I. Microblades

Figure J. Knife

Figure K–M. Chipped points

PLATE IV

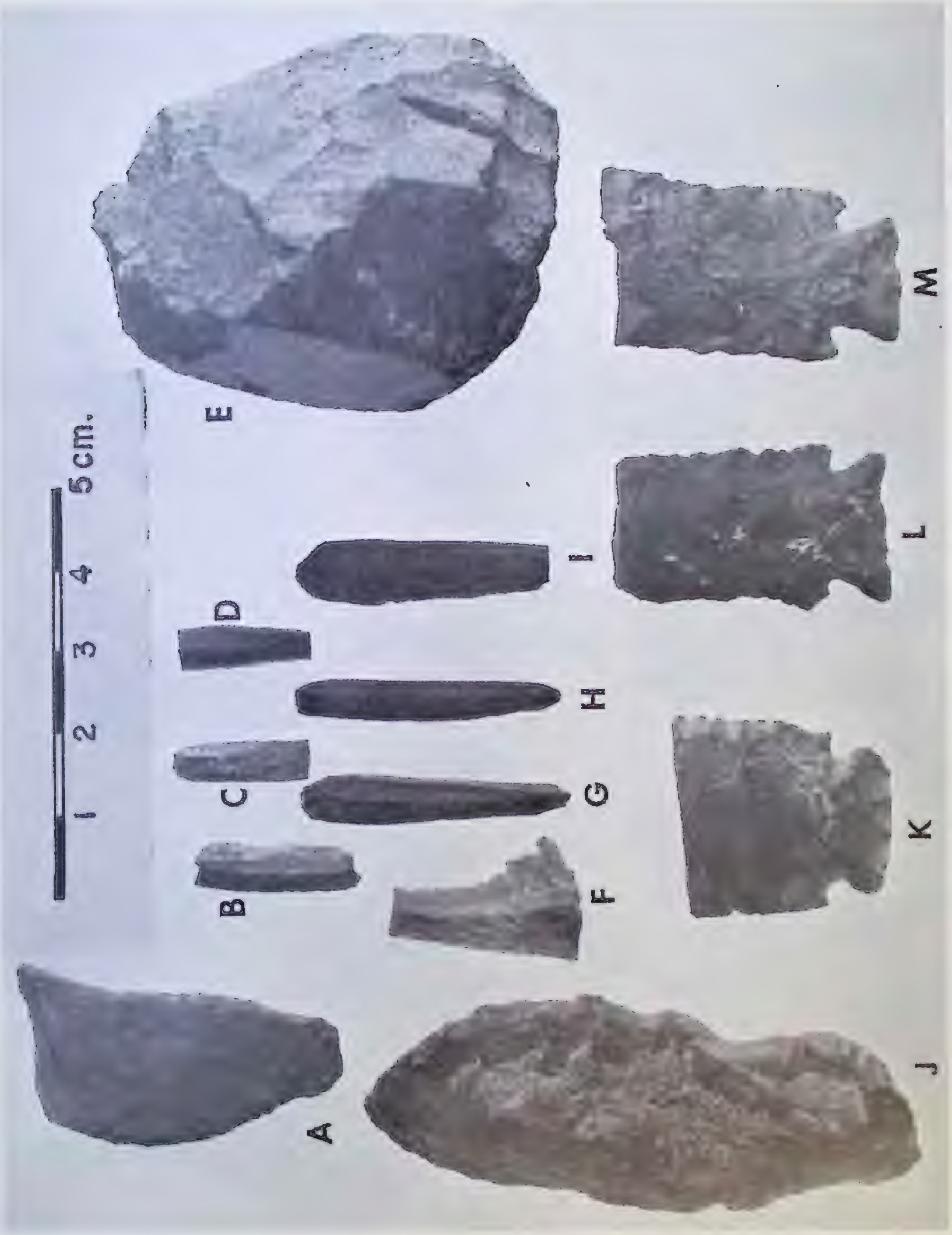


PLATE V

Selected Artifacts from Zone V

Figure A. Cobble chopper
Figure B. Hammerstone
Figure C. Core scraper
Figure D. Hammerstone
Figure E. Chipped knife
Figure F–H. Flake scrapers
Figure I. Chipped knife
Figure J–L. Flake scrapers
Figure M. Plano-convex end scraper
Figure N–T. Chipped points

PLATE V

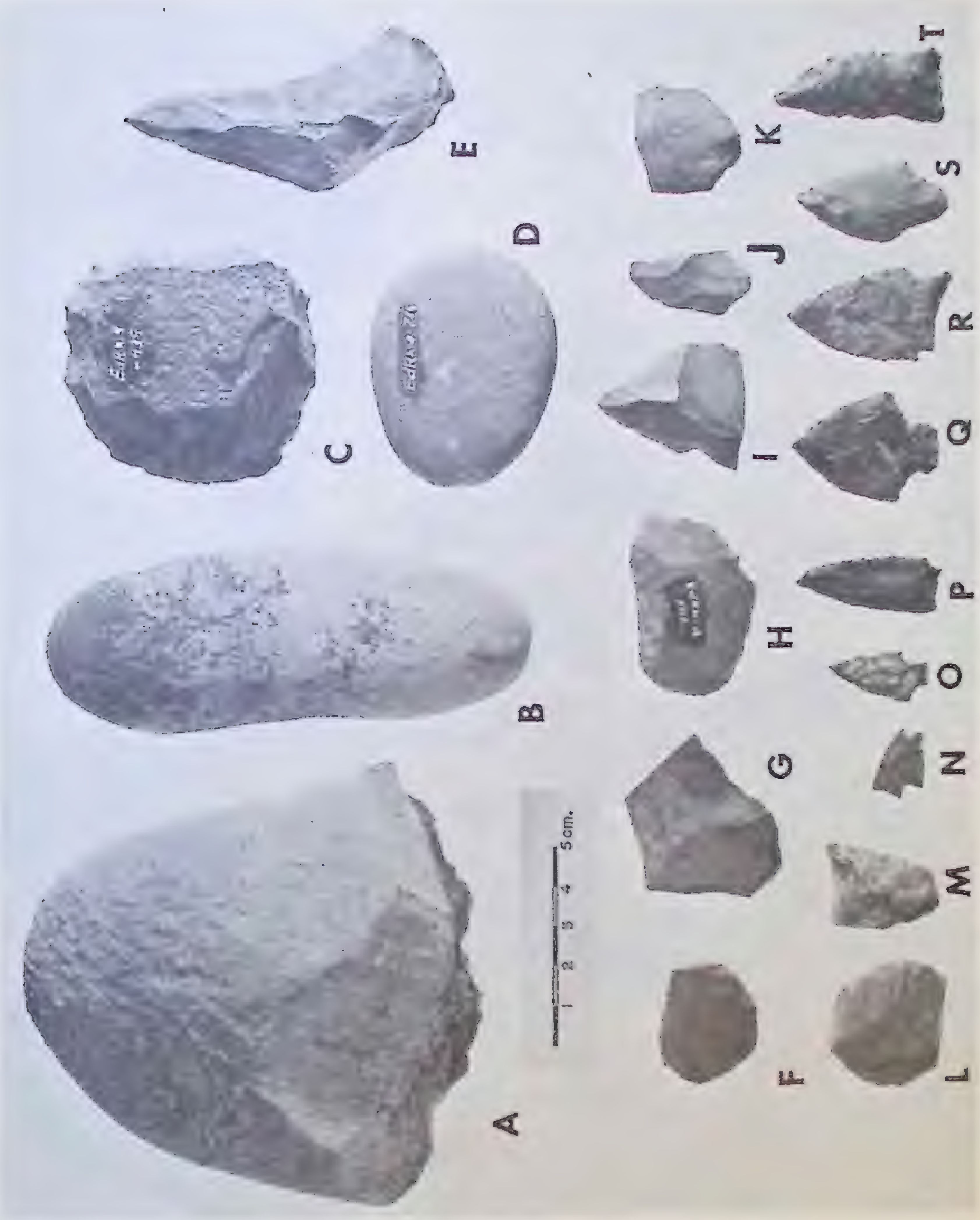


PLATE VI

Selected Artifacts from Zone VII
Figure A. Cobble chopper
Figure B, C. Flake scrapers
Figure D. Scraper plane
Figure E–J. Microblades
Figure K. Chipped point
Figure L–Q. Plano-convex scrapers
Figure R–Y. Chipped points
Figure Z. Chipped knife

PLATE VI

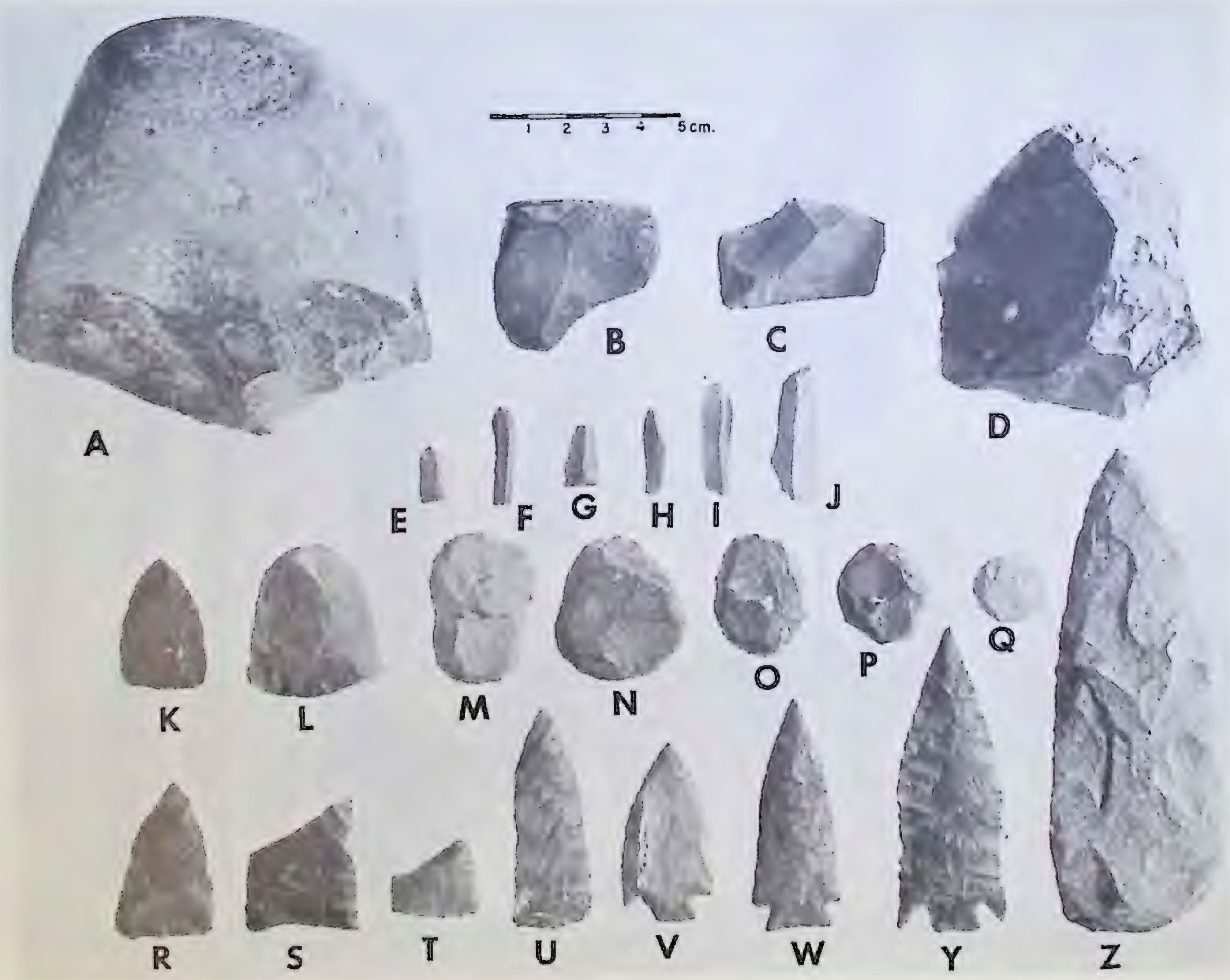
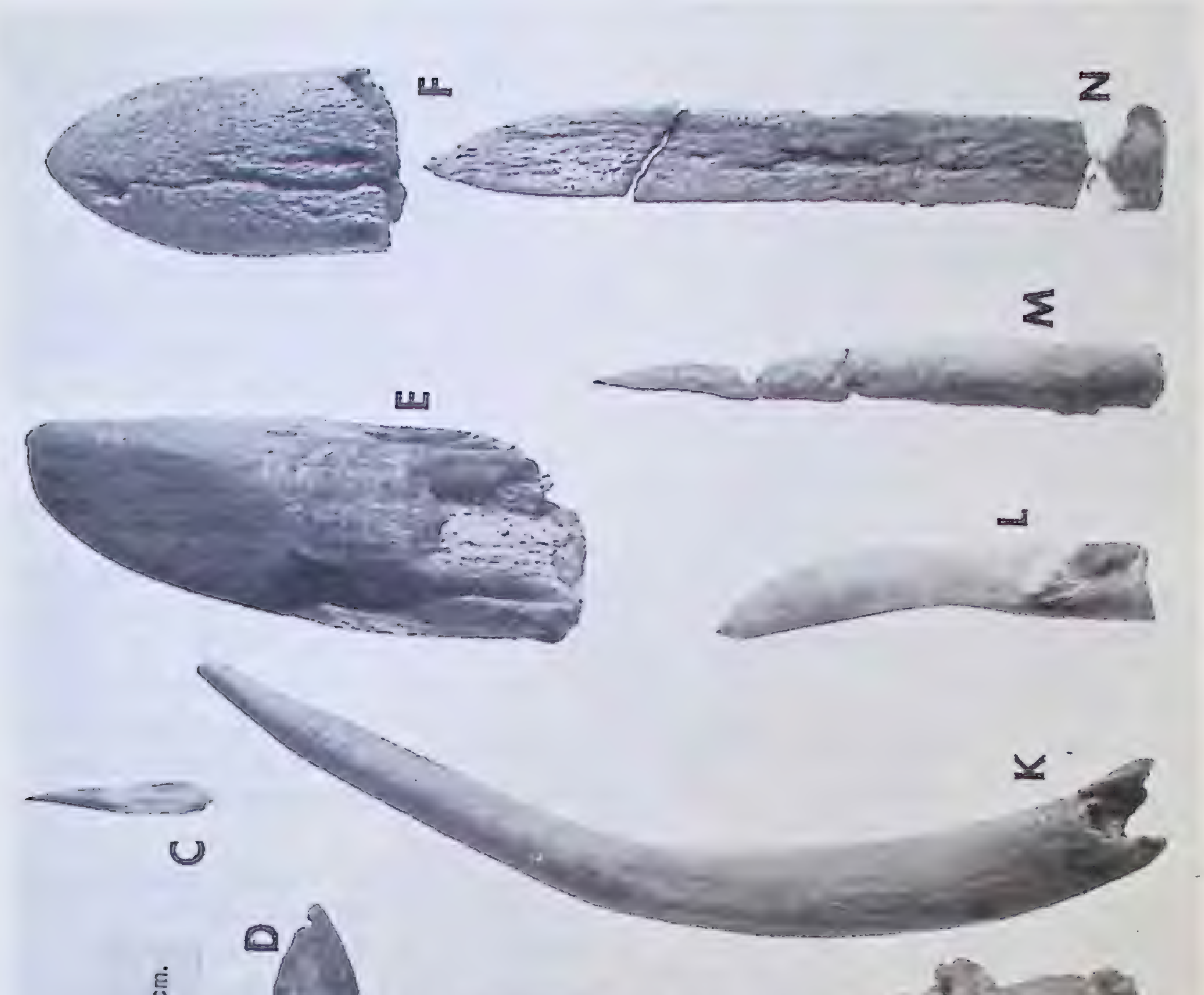


PLATE VII

Selected Bone, Shell, and Antler Artifacts from Various Zones

Figure A. Shell pendant—Zone I
Figure B. *Olivella* shell—Zone III
Figure C. Bone point—Zone III
Figure D. Antler pendant—Zone III
Figure E. Antler wedge—Zone III
Figure F. Antler wedge—Zone VII
Figure G. Deer (*Hemionus*) metapodial awl—Zone III
Figure H. Bone awl—Zone III
Figure I. Bone awl—Zone I
Figure J. Antler in velvet—Zone III
Figure K. Deer antler flaking tool—Zone III
Figure L. Bone awl—Zone IV
Figure M. Bone awl—Zone V
Figure N. Antler point—Zone VII

PLATE VII



PALAEO-ESKIMO REMAINS IN THE PELLY BAY REGION, N.W.T.

BY G. M. ROUSSELIÈRE, O.M.I.*

Since Knud Rasmussen travelled through the Pelly Bay region in 1923, the ethnography of the area has been relatively well known. However, the archaeology of this same region remained until recently almost untouched. This prompted me to take advantage of an extended stay at Pelly Bay Mission to explore the area during the summer of 1956 with the specific purpose of finding traces of a Palaeo-Eskimo occupation.

First to be visited were the numerous islands that dot the bay on which the Mission is situated. These islands bear scattered remains of more or less ancient camping places, but they yielded no significant finds, except perhaps for an ancient Thule house, unfamiliar to the Eskimo, whose outlines had almost disappeared; also found was a grave yielding a Thule inventory. The latter, situated at an exceptionally low elevation, will be the object of a separate report.

On the west coast of Simpson peninsula, the course of Kugarjuk River (at the mouth of which lies the Mission) is interrupted by numerous rapids. A rock formation that eventually attains an elevation of about 400 metres begins its rise near the north bank, but a plain where bedrock breaks through at several places showing numerous signs of glacial erosion separates the south bank and the Orkpik Mountains, 2 or 3 miles distant. A fair number of lakes and marshes occupy depressions between low-lying hills, over which glacial boulders lie scattered.

Many remains of camping places are to be found in the quadrangle formed by the Orkpik Mountains to the south, the sea to the west, and Kugarjuk River and the tributary it receives from Lake Barrow to the north and east. It was principally this area that was surveyed from mid-July onwards; it is there that the oldest tent-rings seem to occur. Some were excavated, but they failed to yield artifactual material.

The first find that could reasonably be interpreted as evidence of a culture older than Thule was a small piece of a chert end blade, reminiscent of Dorset forms. This fragment was found 400 metres from the mouth of the river (Kugarjuk II). Unfortunately, excavations failed to produce other cultural remains.

It was only toward the end of July that two sites were found much farther in the interior, at 2½ and 3½ miles inland. Their excavation very soon revealed them to be Palaeo-Eskimo (Kugarjuk IV and St. Mary's Hill). Excavations began at these two locations on July 26 and after an interruption of three weeks continued again on August 23. Snow had already fallen by this time (August 19), and the ground had begun to freeze. After the 29th, the ground surface thawed only very rarely, and it was often necessary to remove the dirt in small solid pieces and to

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* Roman Catholic Mission, Pond Inlet, February, 1959.

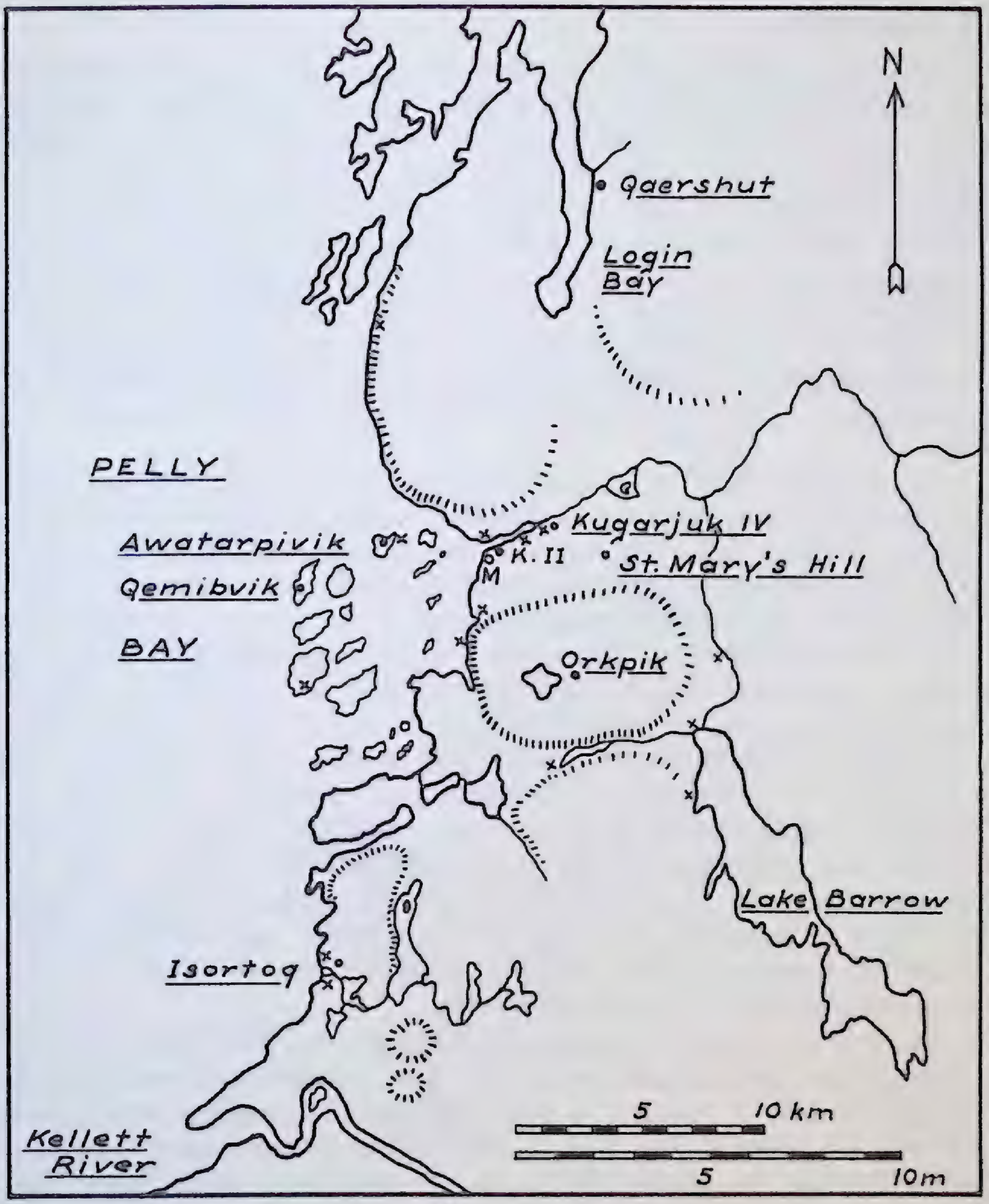

FIGURE 1. The southeast part of Pelly Bay
● Palaeo-Eskimo remains
x Other archaeological sites investigated

wait for the sun to soften them up by midday. In certain spots, six inches of snow had to be cleared away. Despite these very difficult conditions, excavations were continued until September 8, when all work became impossible.

As a result of the very limited time at my disposal and the fact that, except for a few hours, I worked alone, the yield was rather meagre. Nevertheless, I felt that the few data provided by the excavations justify the present report.

St. Mary's Hill

The most prominent rise of land within the quadrangle, defined earlier, is a small hill 3½ miles east of the Mission, which we have designated as St. Mary's Hill (Fig. 2). It has an irregular outline and a flat summit, whose elevation is 70 metres above sea-level. Formerly, it must have constituted an excellent lookout for anyone interested in following the movements of caribou coming from the north, east, or south (caribou now have disappeared from the area). Near the top, on the southeast and northwest slopes, two ancient sand and gravel beaches occur. Although no sea shells are visible on the surface, a pit dug through the southeastern terrace revealed considerable amounts (permafrost was reached at 0.85 metres in September, at a time when the surface was already frozen to 6 or 7 cm).

Between elevations of 60 and 70 metres, on the two beaches already mentioned, as well as to the northeast, near what appears to be an ancient shoreline, a rather large number of house outlines and other remains are visible. They appear to form a complex of considerable age and contrast markedly with tent-rings of the area. Most of these house outlines belong to one of the two following types: (1), a long, narrow form, whose length at times attains 4.75 metres and whose width does not usually exceed 2 metres; (2), an oval or slightly oblong form, at times almost round, whose greatest diameter rarely exceeds 2.50 metres. These two types occur in each of three principal house clusters (e.g., southeast, northeast, and northwest), represented by a few isolated examples as well. In addition to these two types, another much less frequent one occurs: this third type is in the shape of half an ellipse or a bell. These dwelling outlines are defined by a row of stones, usually set tightly against one another. On the two sand and gravel beaches, the stones are so nearly buried in the ground that only their tops are visible.

The few enclosures of rectangular outline to be seen here seem more recent and have been usually built over more ancient features. A distinctive characteristic of the site is the occurrence of curious arrangements of stones of varying shapes, that appear related to the house foundations described earlier, but whose function is not easily apparent. Scant traces of plant cover accompany most of these remains. The sod layer, where it exists, almost never exceeds 5 to 10 cm. In other spots, the ground appears completely sterile.

South Cluster

All remains pertaining to this group are situated on the larger of the two beaches mentioned earlier. The beach gravel, which is rather fine and is mixed with sand at the surface, forms a bare terrace of barren appearance, except inside and around a few of the house features. It may be supposed that all stones above a certain size owe their present position to purposeful human activity.

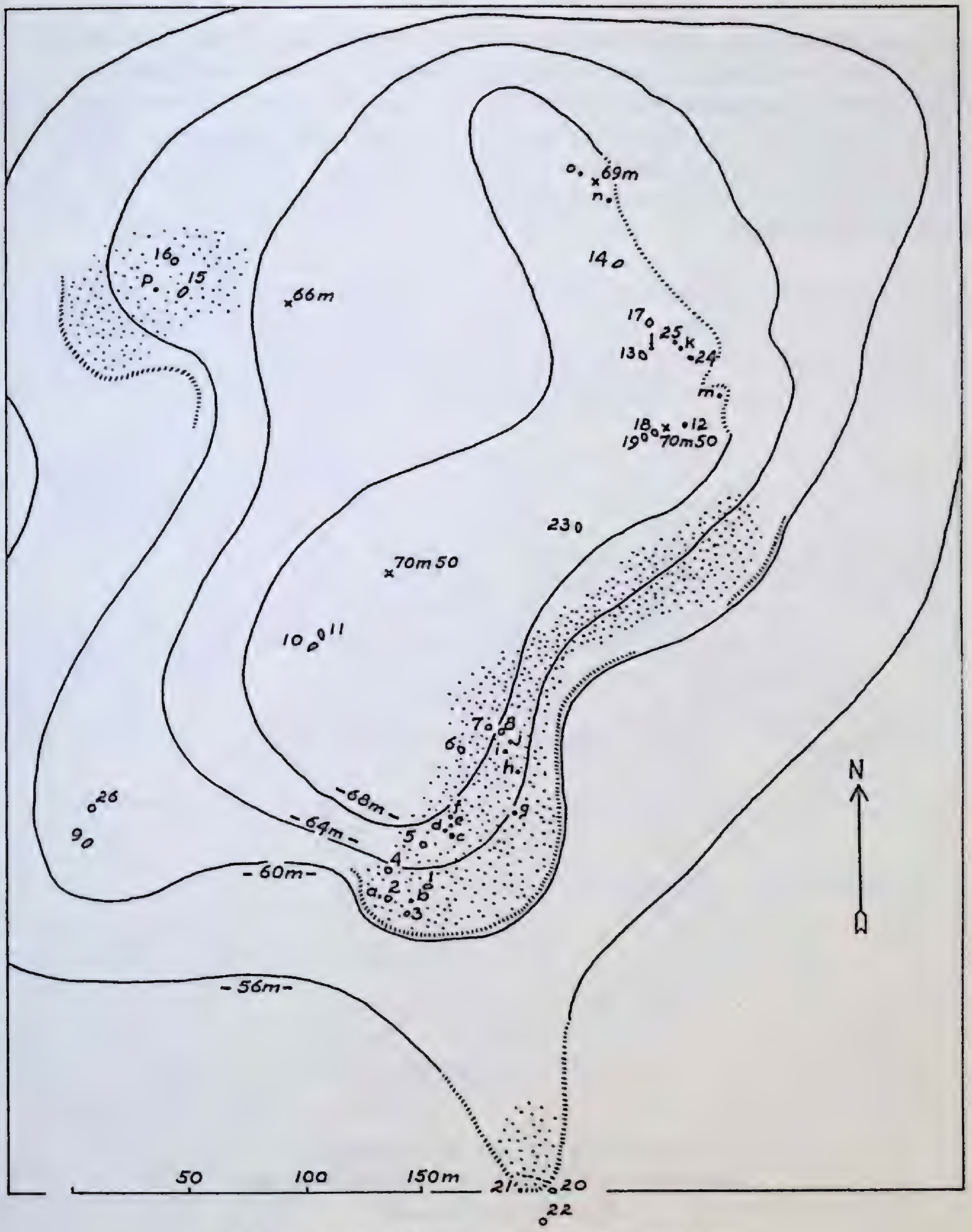

Figure 2. St. Mary's Hill. Overall sketch map

Feature 1. This house outline was selected not only because it is of an unusual shape, but also because it seemed relatively promising: sparse vegetation occurred in the interior and around it, extending outward to a distance of about 1.50 metres (Fig. 3). The feature measures 4.25 by 2 metres. It is kidney-shaped rather than being an elongated ellipse. It is formed by a row of stones, usually two or three stones wide. These stones are, on the average, somewhat larger than the human head, and most of them were level with ground surface; some were even completely buried. They are more numerous than those found in the usual enclosures, and they do not appear to have been greatly disturbed. It is nevertheless difficult to establish their original positions relative to one another. They may have formed a low wall. A low mound about 15 cm in height formed a fill outside the southeast corner.

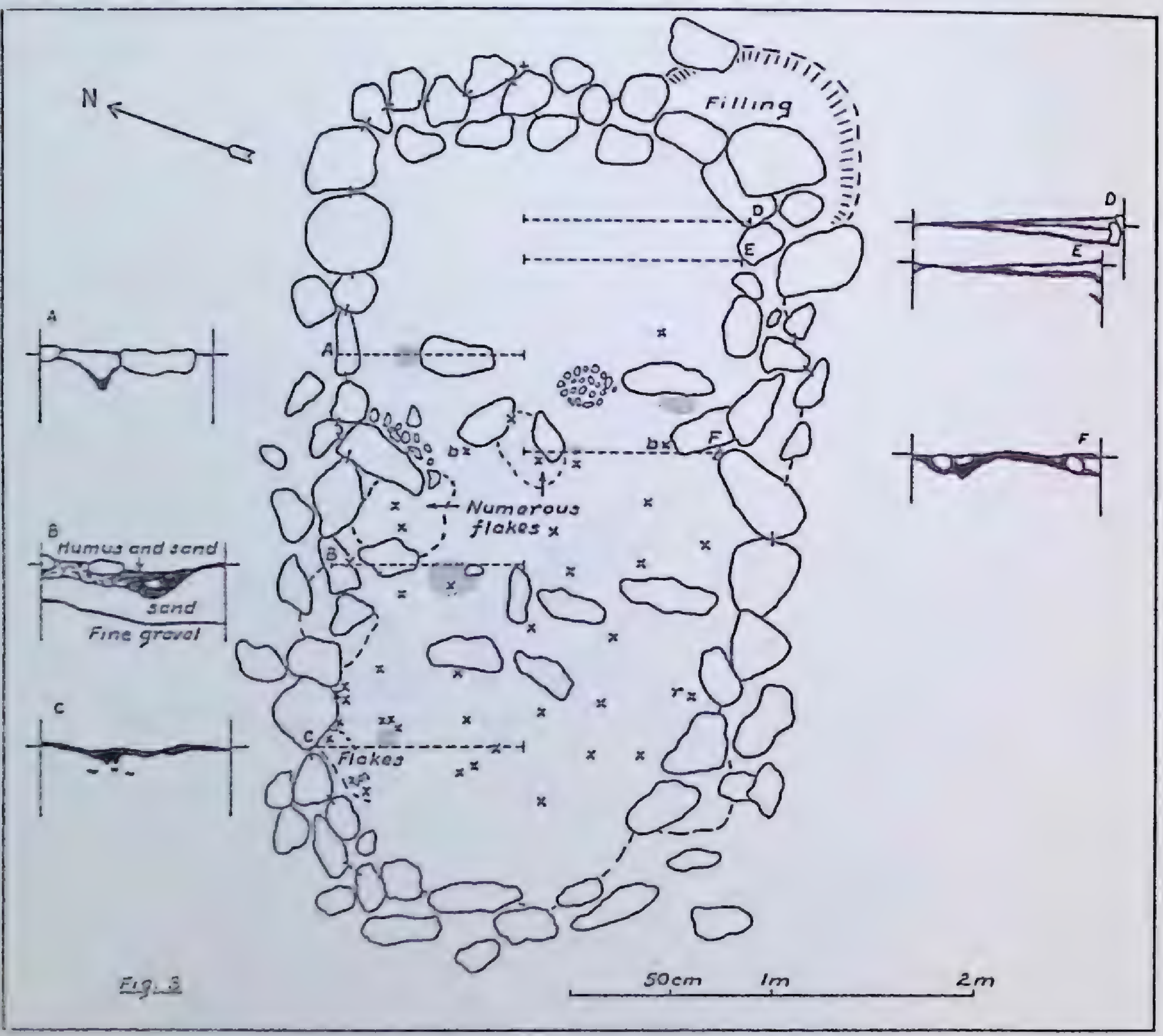

FIGURE 3. St. Mary's Hill, Feature 1
Hatching indicates pits with evidence of fire
x, x—finds of objects
b, b—burins
p—lens-shaped point
r—disc scraper

The interior constituted a slight depression. A dozen stones, similar to those outlining the house feature, occurred near the centre; some of them were hidden by vegetation. The humus layer containing artifactual remains is distributed very unevenly, and varies from 2 to 10 cm in thickness. In some spots, this black earth was mixed with considerable amounts of sand. In other places, and particularly near the edges of the feature, it occurred in the form of several lenses separated by sand. This might mean that the dwelling was abandoned and re-occupied, or at least disturbed by human activity several times in succession. There are no clues bearing on the superstructure of this dwelling. Evidence of fire, in the form of ashes, pits, and cracked stones, was visible in several places, though, contrary to what one might have expected, not in the central area of the outline (*See* Fig. 3).

Offhand, this dwelling brings to mind the double tents which are formed by two ordinary tents joined face to face and are still in use today among certain Central Eskimo. The entrance to these double tents is situated on one of the longer sides, and each end is occupied by a platform bed.

However, in the feature just described, although each of the ends is disposed symmetrically in relation to the short axis of the outline, their functions do not seem to have been identical. Though the western end yielded artifacts and industrial waste in large amounts, such finds were almost absent in the eastern end where, furthermore, the humus layer was generally thinner and less compacted. One rather plausible deduction is that this latter area served for sleeping. In this connection, it is worth noting that the date of appearance of the custom of having a permanent location for the bed is still unknown. It may be that this habit originated with the sleeping platform of the snow-house.

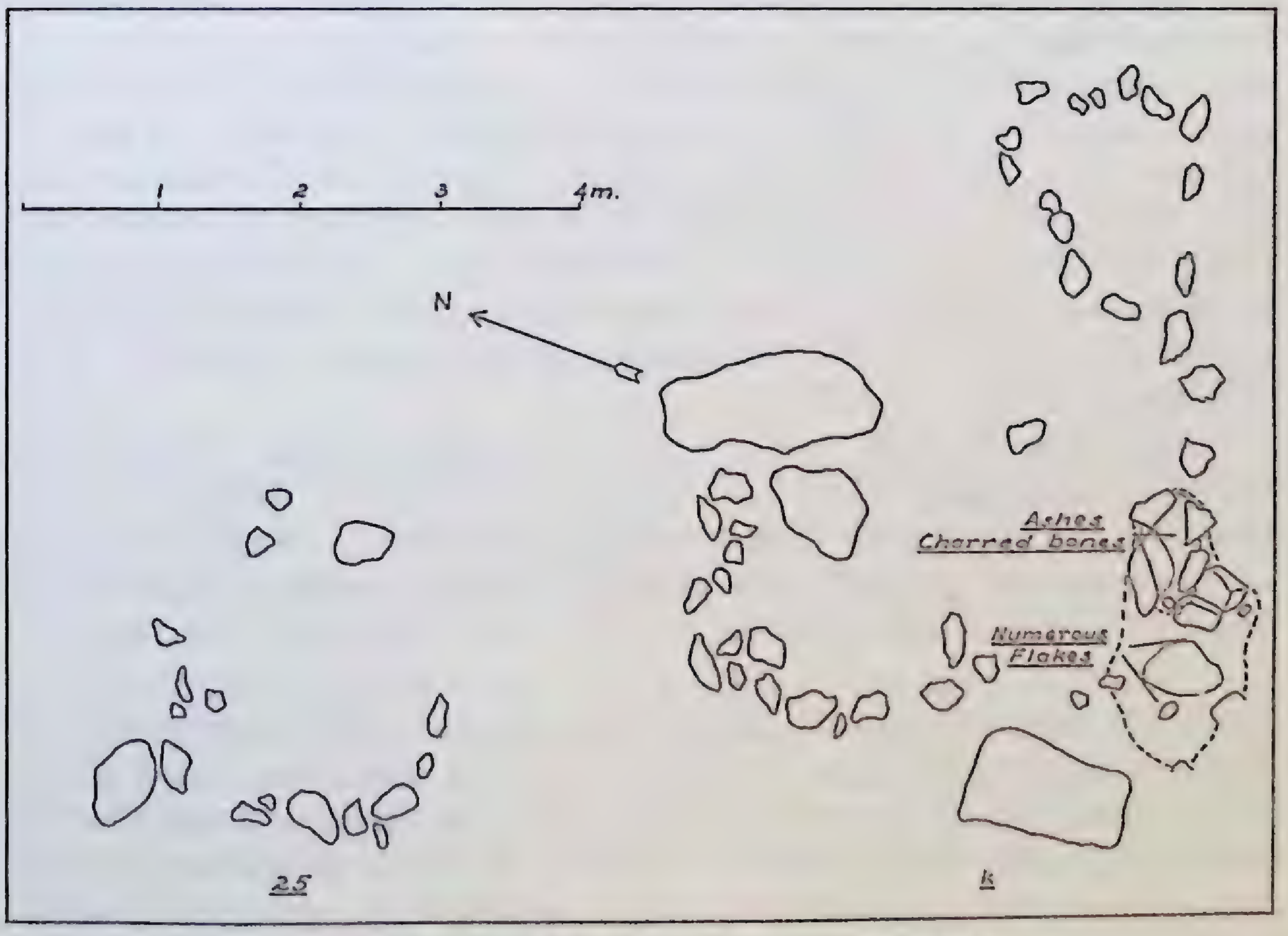

FIGURE 4. St. Mary's Hill, Features *k* and *25*

Only the interior of the feature was systematically excavated. In addition to rather numerous chert flakes, the finds included 41 specimens that may be considered artifacts, though not all of them pertain to identifiable types. Of these objects, some twenty are prismatic micro-blades of chert, of which several have a bevelled pointed end (such as Plate I: 7, 9). A few also bear retouching, particularly near the base. Highly characteristic is the presence of burins; two examples were found. One (Plate I:2) is an angle burin on a blade whose sides are more or less parallel, and both faces of which are retouched. A spall removed diagonally at its upper end has provided the tool with its sharp edge. Scars reveal the earlier removal of three other spalls. The second example (Plate I:3) is broken or completely used up, though the scars left by the removal of spalls are recognizable. In addition, four burin spalls were recovered. A lens-shaped point with serrated edges (Plate I:10) recalls similar examples from Denbigh (Giddings, 1951, Fig. 61, a, 2, 6), New Mountain (MacNeish, 1956), and Sarqaq (Larsen and Meldgaard, 1958, p. 57). It bears slight traces of grinding on one face. The fragment of a projectile point with concave base (Plate I:11) presents close analogies to certain points found by MacNeish on the Firth River (MacNeish, 1958). What is left of the point would suggest that it was very thin and much wider at the mid-point than at the base. A small disc scraper of chert (Plate I:1) bears pronounced serrations along its entire edge. The specimen appears to have no equivalents to date in Arctic archaeology, though, curiously enough, it brings to mind certain Magdalenian objects ("raclettes"). It appears to have been used as a concave rather than a convex scraper. Marks of wear suggest that the intervals between the serrations rather than the serrations themselves were used. The most satisfactory conjecture is that the tool was used in the making of bone or ivory needles. If such were the case, the needles would, in all likelihood, have been circular in cross-section, rather than flat, in the manner of Dorset needles. The latest excavations of Meldgaard at Igloolik in 1957 have shown that roughly cylindrical needles did, in fact, precede flat needles in the eastern Canadian Arctic (Meldgaard, 1960, p. 76, Pl. II).

Other finds include a rather thick triangular flake (Plate I:14), worked on both faces, which bear two opposing sets of diagonal retouch scars. It is probably a point broken during manufacture, though it could also be interpreted as the stem of a projectile point. Another fragment was found which was almost identical to the end of the piece just described.

The object illustrated in Plate I:13 is probably an unfinished point. Other finds from the same location include several thin, broad flakes with slight retouching and traces of wear. Some may have been used as side blades. One of them is rather like an example illustrated by Giddings (1956, Fig. 80:26) and may have served as a graver point or perforator.

No faunal remains were recovered at this location, not even in carbonized form.

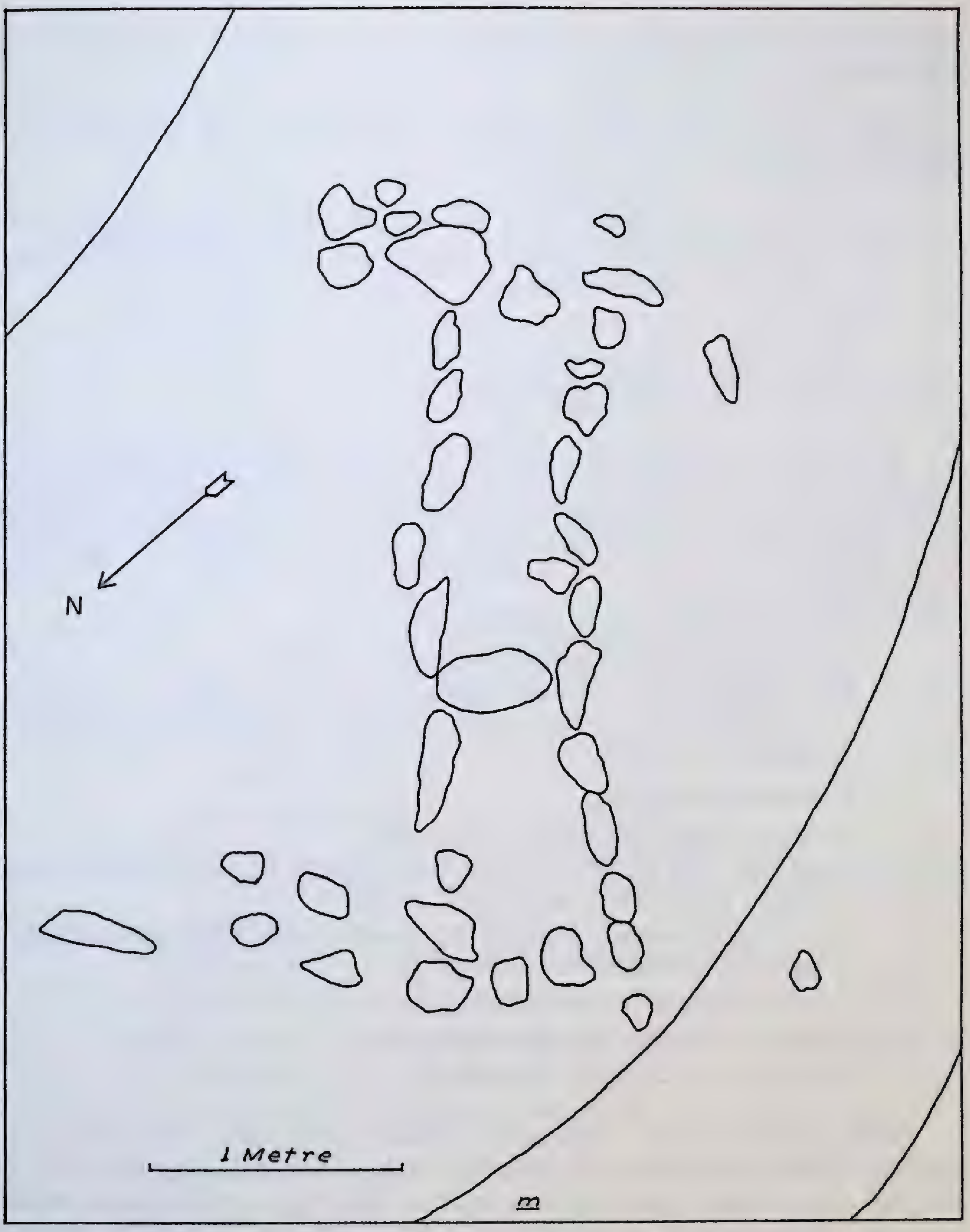

FIGURE 5. St. Mary's Hill, Feature *m*. Contour interval: approx. 15 cm

Feature 2. This feature (Fig. 7) is slightly oblong in outline and measures roughly two metres in diameter. Approximately three-quarters of its surface was cleared under rather unfavourable conditions (partially frozen ground). It failed to yield any artifacts, with the possible exception of what may be a rather large blade of red sandstone, which seems to have been crudely retouched and may have been used as a scraper.

Chert waste in the form of very small flakes occurred near the front and centre of the feature.

Other house outlines. Other (probable) house sites may be noted (the numbers correspond to those on Fig. 2):

—*3* (?)—oval, very small;
—*4* and *5*—rectangular, seem to be more recent: the stones outlining them are not very deeply sunken in the gravel. They probably cover more ancient features;
—*6*—type 1 (or 2): 4.50 (or 2.75 metres) by 2.50 metres;
—*7*—type 2: 2.00 by 1.75 metres;
—*8*—type 2: 2.75 by 2.25 metres.

Miscellaneous features. In addition to house foundations, there occur a certain number of curious stone arrangements, most of which do not fit any classification. Several appear linked to dwellings. Others are isolated. Their plans as illustrated (Fig. 6 and 7) should supplement the brief descriptions below:

a—square, seems to be linked to *2*;
b—small elongate enclosure, between *1* and *2*;
c—a heap of large stones, appears to have been a relatively recent cache (or grave?) built over an older feature, probably a house;
d—horseshoe-shaped;
e—not so long, also open at one end;
f—an arc of a circle; perhaps the remains of an ancient house whose other stones were used for *c*;
g—an oblong feature, 3 metres in length, with cruciform arrangement at one end;
h—rather similar to *d*;
i—heap of stones; thin humus layer;
j—small oval enclosure, opposite *8*.

Most of these stone alignments, which have the form of small enclosures open on one side, are entirely sunken within the gravel. One of the first explanations that come to mind is that they are hearths. However, if such is the case, it is surprising that remains of ash or charred remains would be lacking entirely, quite apart from the fact that such hearths would not seem very practical (as anyone who has made open fires with bone or brush will agree). In all cases, the surface appears sterile. The only two features associated with a black earth deposit (*c* and *i*) are precisely those that do not have the shape of enclosures. Unless one supposes that these hearths were so little used that all traces of fire have disappeared, another explanation must be sought. If these are children's games, it is difficult to see their point. Today, Eskimo children build replicas of the interiors of houses or tents and amuse themselves (!) by building imitation open graves around their playmates. What we have here is different. The hypothesis of a magico-religious function is perhaps the least improbable: these features could be, for example, places where offerings were deposited for spirits or for the dead. This hypothesis was suggested to us as self-evident by an Eskimo of Igloolik some time ago in connection with Dorset remains.

We shall see in due course that such small enclosures occur elsewhere in the neighbourhood of ancient house foundations.

Northeast Cluster

Several features of varying form occur almost at the top of the hill; that is, at an elevation that exceeds somewhat that of most of the remains so far described. Unlike the latter, they are not situated on a sand and gravel beach but on a less even shelf of rock, clay, and gravel, the surface of which, like most of the hill, is strewn with stones and erratics of all sizes. Downhill from this terrace, which faces northeast, it is believed that an ancient beachline may be discerned.

Here again, one finds the house foundation types described earlier; the following numbers refer to their positions in Figure 2:

—*12* has the shape of a semi-ellipse and measures 2.75 by 1.75 metres.

—*13* is oblong and irregular, belonging to type 2 or 3; 2.75 by 2 metres.

—*14* belongs to type 1; 3.50 by 2 metres.

—*17* measures 5 by 4 metres. Made of larger stones and lacking a humus deposit; might be a more recent 'qaggek' (meeting house);

—*18* is of type 1; 3.50 by 2.50 metres; partly disturbed;

—*19* is oval and seems more recent;

—*24* is almost round, and varies from 1.25 to 1.50 metres in diameter;

—*25* is of type 2 (?); 2 by 1.50 metres (Fig. 4).

As on the southern terrace, here also one finds remains that do not seem to pertain to the class of house foundations. The largest of these features (*k*; Fig. 4) measures about 4.50 by 5 metres and has the approximate shape of an inverted *L*, each branch of which ends in a kind of loop. The eastern loop contains no black earth layer. Approximately at the corner formed by the two branches of the *L* there is an ancient hearth, which contains a fair amount of ashes and fragments of charred bones. An area of approximately two metres square was cleared, further excavation having been halted for lack of time. Within and all around the hearth, the humus layer was filled with thousands of chert flakes, particularly in the eastern portion, around a large flat slab located about 10 cm below present surface, which probably served as an anvil or workbench.

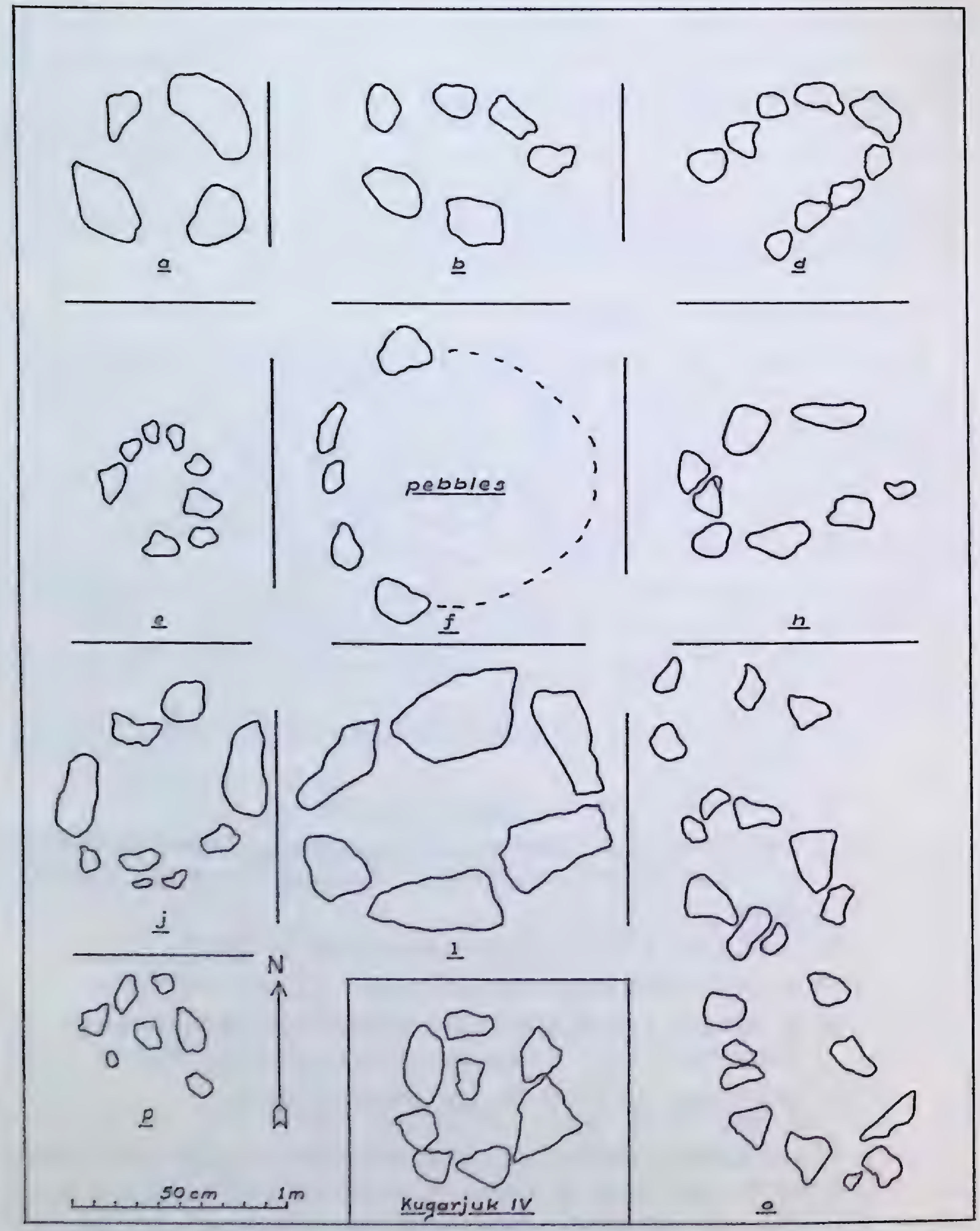

FIGURE 6. St. Mary's Hill. Various stone alignments (same scale, same orientation)

Two fragments of very small and very thin end blades lacking the base were found among the flakes. One had a lanceolate pointed end (Plate I:17). One specimen might be interpreted as a very crude burin, but no unimpeachable prismatic micro-blade was found. Two narrow flakes may be burin spalls. The numerous flakes included a large number of very thin and often translucent scale-like chips measuring 8 to 15 mm.

Many other flakes bear evidence of retouching. Some appear to have been used. The production of scale-like flakes appears technically characteristic.

Figure 6, *l* shows a subrectangular enclosure about one metre long, formed of large stones, facing feature *13* (Fig. 2), from which it is 3 metres distant. The slab closing the eastern end is placed on edge. The interior was excavated but yielded only a humus layer with no evident trace of fire. Nevertheless, it is not impossible that this was a hearth. It may also have been a child's grave.

Figure 5, *m* is formed of two parallel alignments, approximately three metres in length, which are perpendicular, at both ends, to two other rows of stones projecting to either side. The space enclosed is further divided by a large stone near the mid-point. The inside of each rectangle thus formed was excavated. The area contained several pebbles and a small amount of black earth but no industrial remains. This feature recalls somewhat the finds of Knuth (1954) at the centre of some house foundations in northeastern Greenland. Yet, it would not seem that we are dealing here with a median passage, inasmuch as no other remains occur in the vicinity, and that the surrounding area is sterile. Furthermore, the ground is somewhat sloping at this point, and this slope is more marked toward the western corner.

Figure 7, *n* is an irregular enclosure, with a rectilinear alignment of stones leading off to one side.

Figure 6, *o* is a narrow, elongate stone arrangement situated on bedrock.

Northwest Cluster

A narrow gravel and sand beach facing westward bears a house foundation (feature *15* of Fig. 2) of type 1, measuring 4.25 by 2.25 metres. As in *l*, several stones are visible in its central portion.

Figure 2, *16* (type 2) measures 2.25 by 1.75 metres. A few metres away and somewhat downhill from it, there is a small enclosure (*p*) with a stone in its centre.

Other Scattered Remains

In other spots on the top of the hill, and apart from certain tent-rings whose recent origin seems obvious, there occur several other features of ancient appearance (Fig. 2):

—*10* belonging to type 1 (or 3?);
—*11* of type 1; 4.75 by 2 metres;
—*23* of type 1.
Somewhat farther down, to the southwest:
— *9* rectangular;
—*26* circular, probably more recent.

Very near a small sand and gravel spit downhill from the southern beach, we have (Fig. 2):

—*20* of trapezoidal shape;

—*21* horseshoe-shaped; and
—*23* which is oval.

Features *21* and perhaps *23* appear to be the work of children and are probably more recent. An alignment of stones some fifteen metres in length begins at feature *20* and crosses over the sand-spit in curving slightly southward. A hundred metres or so northeast of the second group and somewhat lower down, there are camp remains that seem more recent.

I have provided this somewhat lengthy enumeration mainly because, until now, very little information was available on the form and nature of Palaeo-Eskimo dwellings older than Dorset. Despite insufficient excavation, particularly in the Northeast Cluster, it would seem that the three groups of remains described do pertain to a Palaeo-Eskimo complex (perhaps two), presenting several parallels to similar complexes known between Bering Strait and the east coast of Greenland. These remains provide convincing indications of being old. Unless maintaining that the inhabitants themselves are responsible for burying the stones that outline their dwellings, one must admit that a considerable time span must have elapsed to permit these stones to sink completely into the ground (it should be noted that in features of more modern appearance, such as *4* and *5*, the stones are barely set in the ground). In addition, the complete absence of non-carbonized bone indicates that these cannot be the remains of recent camps. Furthermore, there are good reasons to think that these remains date from a time when sea-level was 50 to 60 metres higher than it is today. Most, indeed, seem associated with ancient beachlines. Confirmation for this hypothesis might be seen in the fact that, at *k* at least, bone was used as fuel. Observations today show that this type of fuel, together with blubber provided by sea mammals, is generally used only on the seashore. Finally, the industry revealed by the excavations resembles, most of all, relatively old components discovered at Cape Denbigh (Giddings, 1951), Firth River (MacNeish, 1956), North Knife River (Giddings, 1956), Igloolik (Meldgaard, 1960), Devon Is. (Lowther, 1962), Sarqaq (Larsen and Meldgaard, 1958), Independence Fjord (Knuth, 1954), Juet Island (Maxwell, 1962), Mansel Island and Ivugivik (Taylor, 1962).

The small number of objects recovered does not allow one to single out specific types with which to place the site precisely in Giddings' classification (Giddings, 1956, p. 264). However, the frequency of prismatic micro-blades, as well as the presence of burins and points with concave bases call to mind more particularly the Denbigh Flint complex (Giddings, 1951) and the New Mountain complex of MacNeish (1956). To the east, it is probably with Independence I (Knuth, 1954) and Palaeo-Eskimo remains of the Igloolik area (Meldgaard, 1960) that similarities are closest. Only further excavation will tell us whether the absence of micro-blades at feature *k* is fortuitous or whether it indicates a different industry.

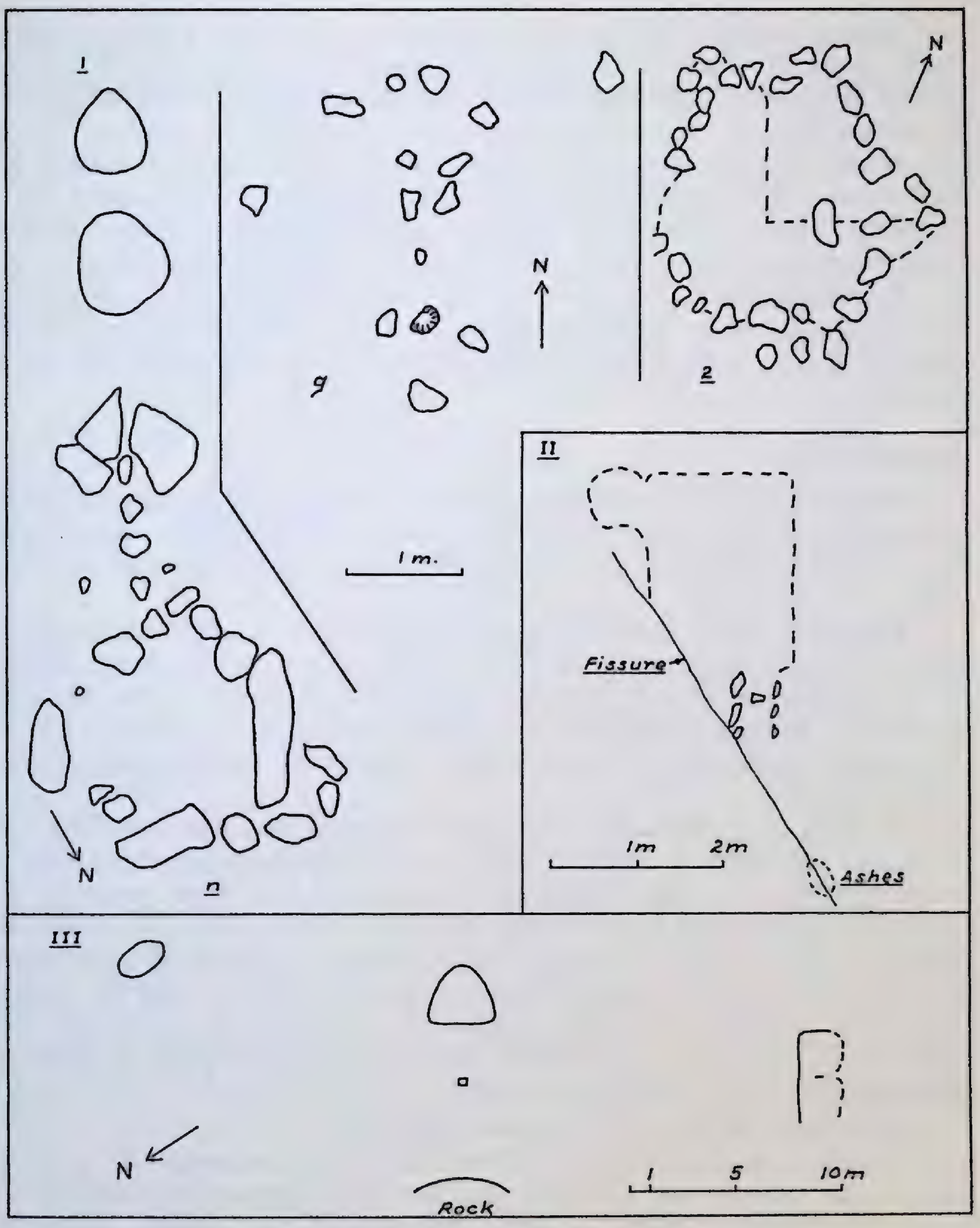

Figure 7. St. Mary's Hill, Features 2, *n.g.*
II. Isortoq
III. 45-metre hill

45-Metre Hill

Though excavations did not take place at this locality, the following features should be noted, inasmuch as they differ little in appearance from those already described. About 600 metres west of the South Cluster described earlier, three house outlines face northwest on a small rocky eminence about 45 metres above sea-level (Fig. 7). One of these is oblong and belongs to type 2 (2.25 by 1.30 metres). Another has a semi-elliptical outline (type 3) of the kind already described (3 by 3 metres). The third reveals only one straight side clearly, approximately 4 metres in length: it appears to have been either rectangular or similar to type 1. Facing the second house site, there is a rectangle (30 cm by 35 cm) formed by four stones measuring 10 cm to 20 cm in height and enclosing a layer of humus. No clear evidence of fire was found. Finally, somewhat farther away, there is an arc of stones, the concavity facing northwesterly.

If it were shown that these remains are associated with the same industry as the others described earlier, it would be difficult to date the latter at a time when sea-level exceeded its present elevation by 50 to 60 metres.

Kugarjuk IV

About two and a half miles from its mouth, the Kugarjuk River passes between two steep banks before widening to form a small lake. To the south rises a small rocky eminence topped by an *ublisaut* or tower trap.

Feature A. About 75 metres east of this eminence and 27 metres above sea-level, there is a house foundation whose outline is not clear, though it is probably subrectangular, measuring 5 by 4 metres. Its centre is marked by a slight depression. The stones outlining it appear to have been greatly disturbed, and most of them have sunk rather deep into the ground (Fig. 8).

An area of approximately five metres square was excavated. Below the sparse vegetation, a rather uneven layer of black earth, averaging 10 cm in thickness, covered the interior. Remains of fire were found in the central area, along with a rather large number of slabs of highly weathered schist, many of which have been crudely shaped. Several of these slabs had been placed on their sides. Directly south of the fire area the humus layer became much thinner and capped an accumulation of gravel: this might be interpreted as the remains of a platform. Finally, at point *b*, numerous rather large flakes were found.

The objects recovered include the following:

—A small ivory or bone mask (Plate I:15) perforated in the areas of the mouth, nose, and eyes, and having a suspension hole near its upper edge. Despite a dense network of root marks, the mask gives the appearance of fine workmanship. The nostrils have been carved from the inside, and the septum is well defined;

—Three prismatic micro-blades, one of which has been retouched near the base so as to have two symmetrically placed notches;

—Several burin spalls, one of which bears the scars of two others removed earlier. Another bears retouching (Plate I:18), and a third shows evidence of grinding;

—The fragment of a worked object (Plate I:19), which appears to have been used as a scraper;

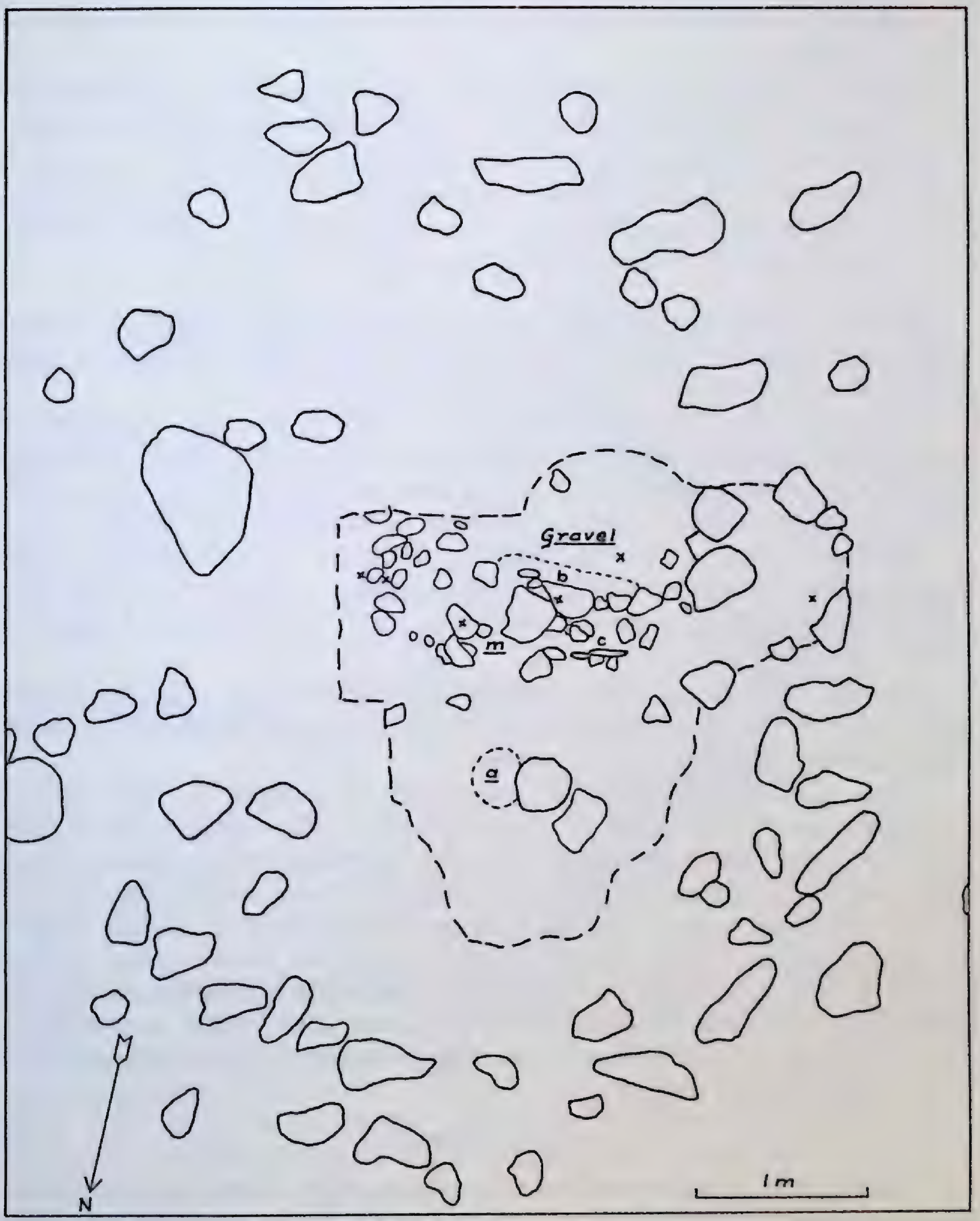

FIGURE 8. Kugarjuk IV

a—numerous large flakes

b—thicker humus, traces of fire; small flat stones

c—numerous slabs

x—bone

m—mask

—A few retouched flakes, some of which may have been used as perforators or gravers; others may have been side blades;

—A large flake of red sandstone, crudely retouched in the shape of a point;

—A slate plaque in the form of half an ellipse, with one edge that appears to be polished through use, probably in softening skins;

—Six bones or fragments of bone were also found. One at least is that of a ruminant (small musk-ox or caribou). Two fragments that fit together belong to a very heavy bone (bear or whale) which seems to have been worked.

A dozen metres to the north of this house outline, there is a small rectangular stone enclosure on the bedrock surface. It contains a stone in its centre. No traces of fire were found (Fig. 6).

Feature B. Some 250 metres south of the location just described and at a slightly higher elevation (31 metres), at the top of a small hummock, there is a house foundation of similar appearance, measuring 3.25 by 2.50 metres. A test pit showed a layer of humus containing chert waste.

Feature C. Some 15 metres west of "A," there is a house foundation measuring 5.50 by 4.50 metres. Its subrectangular outline is marked by a regular arrangement of large stones barely set in the ground. A layer of humus also occurs.

Several other house sites, mostly of elliptical or near-rectangular shape, occur in the immediate vicinity to the west and south. One spindle-shaped outline measures 4 by 2 metres.

Here again, excavations were not extensive enough to allow definite conclusions as to the origin of these remains. The occurrence of bone and ivory, the lower elevation, and the presence of a ground burin (indicated by the ground burin spall) suggest a more recent age than for the site described earlier, and the rectangular house plan recalls that of the Dorset culture. Stones placed on edge inside the house occur at some of the locations excavated by Knuth in northeastern Greenland (Knuth, 1954). It would seem, therefore, that we have here either a pre-Dorset culture, though one more recent than the complex of St. Mary's hill, or a very early form of Dorset.

OTHER SITES

Kugarjuk II. A house outline of approximately triangular form, adjacent to a large boulder and connected to a rock outcrop by means of two parallel stone alignments on the river side, is situated some 400 metres from the mouth of the Kugarjuk River, on its south side, about 20 metres above sea-level.

Almost total excavation yielded only the fragment of a finely worked chert point.

Insortoq. A dozen miles south of Pelly Bay Mission, near the mouth of a small stream whose muddy waters are responsible for the name of

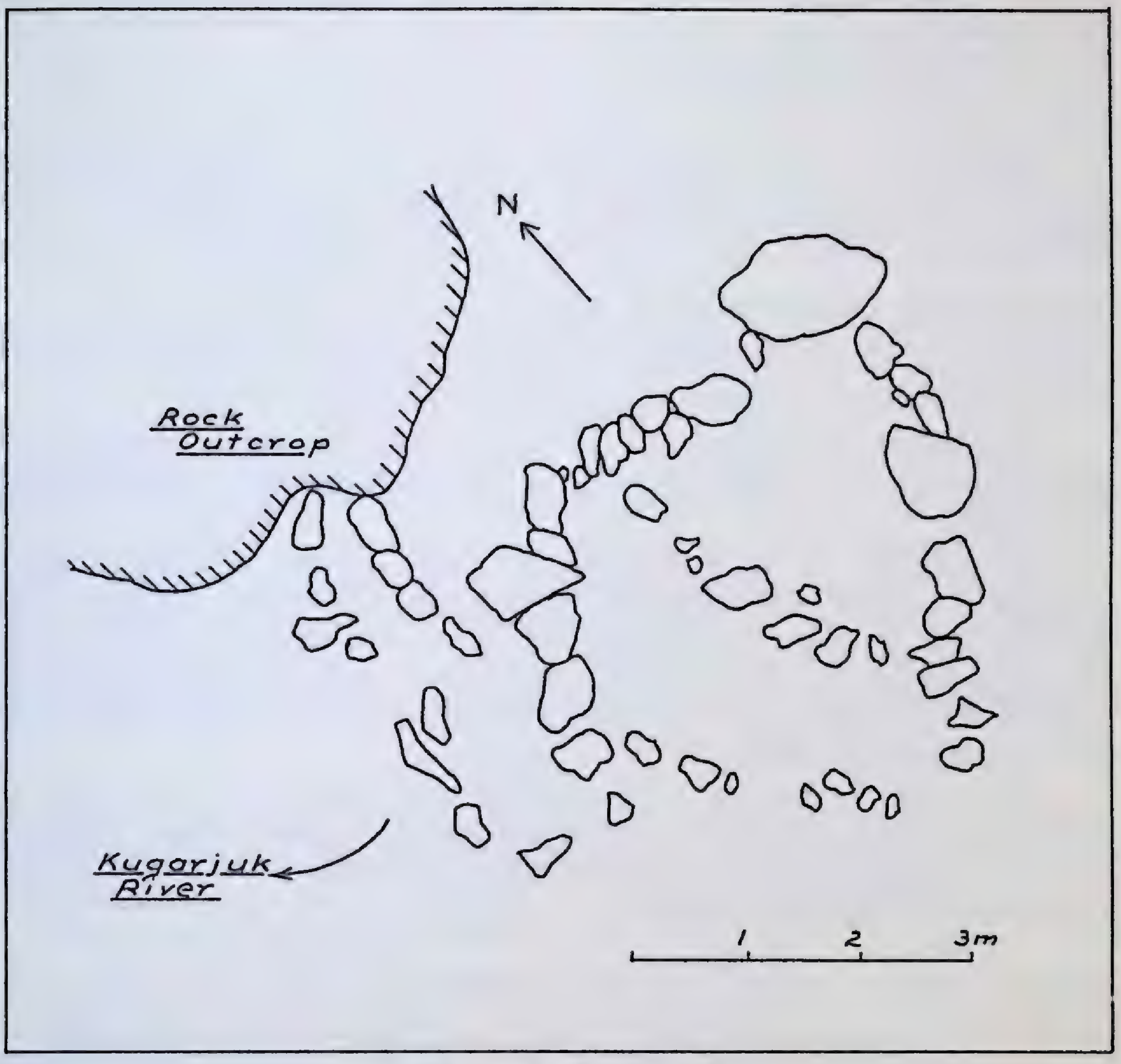

Figure 9. Kugarjuk II

'Insortoq' being given to this part of the coast, there are several Thule house ruins. Some three-quarters of a mile farther inland, at an elevation of 25 to 30 metres above sea-level, surface remains include a rectangular tent-ring measuring 2.25 by 1.75 metres. There is a kind of passageway in front and to one side, and a small round enclosure was noted in back. A fissure, probably caused by solifluxion, cuts across the forward angle opposite that of the passageway and passes in front of the latter. It is probably also due to solifluxion that a rather thick layer of humus, sometimes entirely absent near by, occurs along this fissure. Some traces of fire remained.

On the contrary, black earth does not appear inside the house feature. However, several remains of a stone industry were found under stones, pebbles, and gravel. They included—

—A small, bifacially retouched asymmetric blade, base missing;

—A large retouched and broken flake;

—The fragment of a tool (burin-like implement?) with traces of polishing;

—A long, thin flake.

Though few, these specimens do provide some valuable clues. The polished fragment and the asymmetric blade, as well as the house form, lead us to believe that this is probably a Dorset tent-ring.

Other Probable Palaeo-Eskimo Remains

(a) Qemibvik Island: at an elevation exceeding 20 metres, on the western slope, ancient disturbed tent-ring of elliptical shape.

(b) Awatarpivik Island: on the eastern slope, at an elevation of some 30 metres, two roughly rectangular house foundations, outlined with large stones.

(c) Qaershut: on the eastern shore of Login Bay, at an elevation of approximately 30 metres, in the former bed of a small stream which has now dug for itself a gorge into which it falls from a height, there are a few house outlines, of which one has a sort of entranceway of stones. Half of another house may be seen at the edge of the gorge, into which the other half has fallen.

(d) Orkpik: in the central portion of the range, at an altitude of 200 to 300 metres, three-quarters of a mile east of a lake which measures over one mile in length, a seemingly very old trapezoidal house outline was observed on a gravel terrace.

CONCLUSIONS

In view of the limited amount of excavation done, it can only be said at present that the Pelly Bay area evidently contains very ancient traces of settlement and, in particular, the remains of industries which, though probably pertaining to several different periods, are closely related to Palaeo-Eskimo complexes found elsewhere in the Arctic, from Alaska to Greenland.

It is noteworthy that these remains are associated with several distinctive house types.

Further work at the two principal sites discovered should lead to more information, so as to allow a more exact chronological placement of these remains.

ACKNOWLEDGMENTS

The author is very grateful to Professor Paul Tolstoy, who kindly undertook the English translation of this paper, originally written in French. I also wish to thank Mr. William Taylor, of the National Museum of Canada, for his helpful comments, and the Rev. Father Van de Velde, O.M.I., of the Pelly Bay Mission, as well as Mr. Andrew Macpherson, of The Canadian Wildlife Service, for their very welcome assistance in the course of this archaeological reconnaissance.

NOTE: Upon his return to Pelly Bay in the summer of 1960, the author was able to continue his research. Excavations which were resumed at St. Mary's Hill provided some new information on the industry and the house type. In particular, the proportion of burins in relation to prismatic blades was found to be higher, and a significant distribution was noted for artifacts in relation to the house plan.

In addition, nine new sites, most of them pre-Dorset, the rest early Dorset, were located at different points about the bay. The pre-Dorset, which were mostly characterized by their relative abundance of burins, seem to fit generally within the Arctic Small Tool tradition.

These finds will be the subject of another report, and the characteristics of Thule culture in the Pelly Bay region will also be the object of a separate study.

RÉSUMÉ

Une reconnaissance archéologique a révélé dans la région de Pelly Bay l'existence de plusieurs sites appartenant au Dorset ancien et au pré-Dorset. L'un de ces derniers a livré une industrie comprenant surtout des burins, des lames prismatiques, quelques pointes de projectiles et des grattoirs. Cette industrie semble apparentée surtout au Complexe de New Mountain et de Denbigh. Elle était associée à plusieurs types de fonds d'habitations et à d'autres assemblages de pierres de formes caractéristiques.

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PLATE I

Artifacts

Fig. 1. Small chert disc scraper

Fig. 2. Angle burin

Fig. 3. Broken angle burin

Fig. 4, 5, 6. Burin spalls

Fig. 7. Micro-blade of chert with bevelled pointed end

Fig. 8. Fragment of micro-blade

Fig. 9. Micro-blade of chert with bevelled pointed end

Fig. 10. Lens-shaped point with serrated edges

Fig. 11. Fragment of a projectile point with concave base

Fig. 12, 13, 14. Worked chert fragments

Fig. 15. Small ivory or bone mask

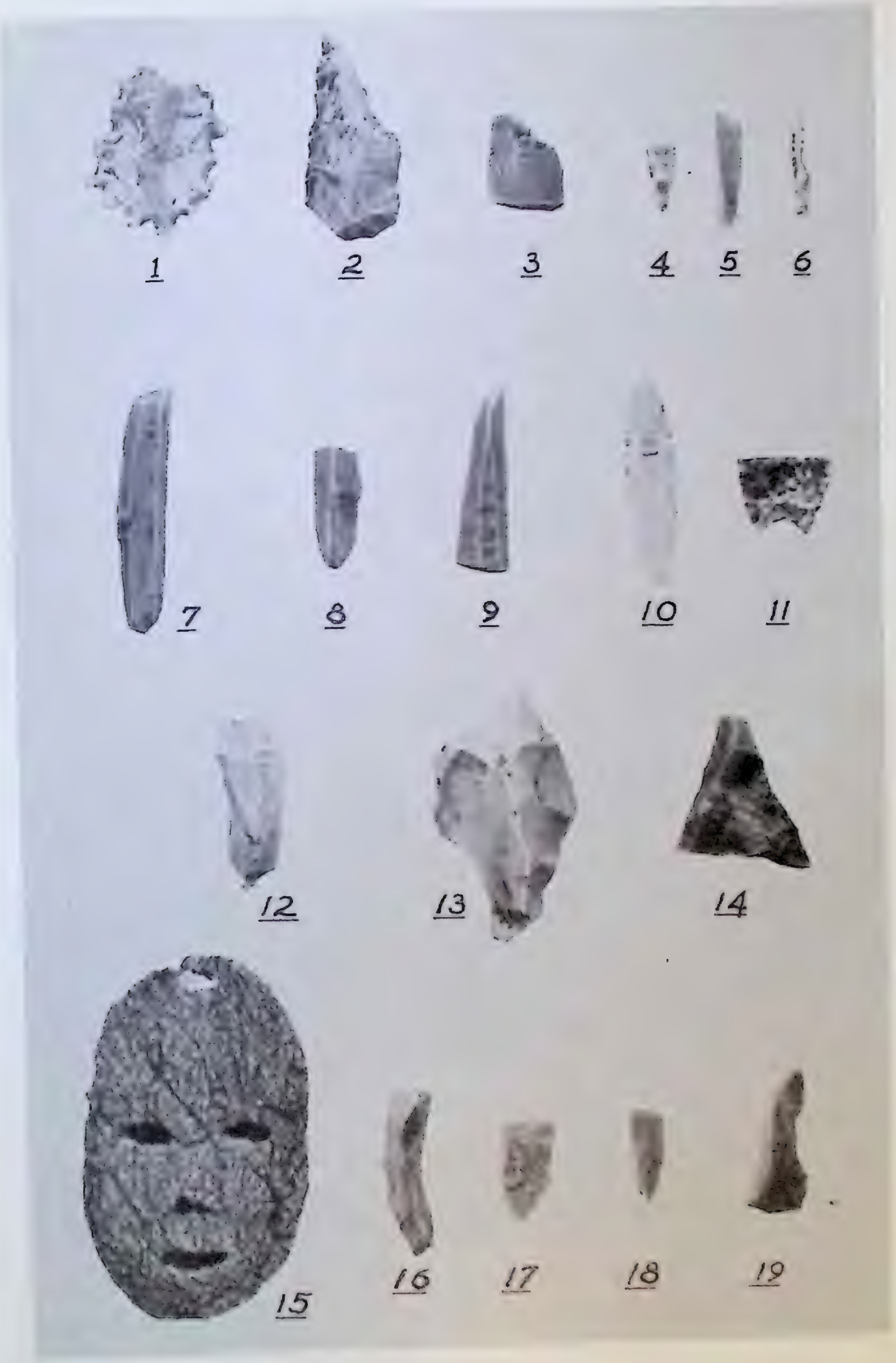
Fig. 16. Worked chert fragment

Fig. 17. Fragment of end blade with pointed end

Fig. 18. Burin spall

Fig. 19. Worked fragment

PLATE I



EVIDENCE OF BOREAL ARCHAIC CULTURE IN SOUTHERN LABRADOR AND NEWFOUNDLAND[†]

By Elmer Harp, Jr.[*]

INTRODUCTION

This is primarily a working paper for the purpose of describing certain archaeological materials from southern Labrador and northwestern Newfoundland, together with such analysis and interpretation as is reasonable and practical at this time. Although presented in its entirety, the evidence to be discussed is limited in extent, as well as in terms of its provenience, and therefore I can only hope that it will serve well as part of the foundation for future research in that region.

The quickening pace of archaeological research throughout the North American Arctic in recent years has destroyed many of the comfortable, uncomplicated views formerly held about the development of prehistoric cultures there. A bewildering array of new components, complexes, phases, and traditions has been discovered and elaborated, but, as of the present, no entirely satisfactory reintegration of concepts has been achieved. As a social and cultural animal, man has evolved myriad adaptations throughout his long history, and it is now evident that his representatives in the New World Arctic were no less complex, despite the limiting factors of their circumpolar environment.

One unaltered facet of the general Arctic problem still concerns the nature of the ancient relationships between Indian and Eskimo cultures, particularly in regions where, and time horizons when, the peculiar Eskimo way of life was being developed. This question has been especially crucial in the Northeast, where it seems to have originated with Abbot (1881). Later it was highlighted by Jenness (1929) in terms of contact and diffusion between the Beothuk Indians and Dorset Eskimos in the Strait of Belle Isle region, and other students, too, have been concerned with various of its implications (cf. for example, de Laguna, 1946; Ritchie, 1951, 1962; Harp, 1953; Byers, 1959, 1962). Although it has now been shown quite conclusively that the early Eskimos could not have made an important cultural contribution to the Boreal Indians, who were their undoubted predecessors in the Northeast (Ritchie, and Byers, op. cit.), there still exists a possibility that a reverse exchange occurred. In this region, as far as one knows, the earliest Eskimo folk were probably of the Dorset culture, and, in speaking of early Dorset, Meldgaard has stressed that it "smells of forest" (1960, p. 593) and was strongly influenced by, if not derived from, Indian culture. However, not all students agree with him.

[†] For conciseness the term "Newfoundland" in this report is used to denote the Island of Newfoundland.

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This controversy arises simply from the inadequacies of our present knowledge. To an important degree, I believe it stems from our inability to identify the specific factors in the problem, particularly in Newfoundland and Labrador. For instance, one can speak rather confidently of broad cultural traditions which represented man's adaptations to the special requirements of life on the Arctic tundra, or in the Boreal Forest zone, but this may not be a sufficient analytical refinement where both environments occur transitionally, as in the extreme Northeast. There one might better ask what particular societies were involved in the practice of these traditions, for elsewhere there is evidence of Eskimos in the fringes of the forest (Giddings, 1952) and of Indians on the tundra (Harp, 1961). This shows that people from each zone occasionally crossed over the line, so to speak, and made at least partial, or temporary, accommodations to an environment which, according to conventional views, was basically incompatible to them.

Possibly this indicates that such people shared enough of a common culture base to make needed adaptations to peripheral environments, although each in turn, whether Boreal Indian or Eskimo, was oriented to life in a specific environment and naturally preferred existence there. Such a view is quite in accord with what is known about the coastal-interior dual subsistence economy of past and recent Eskimos, and I believe that it at least partially answers Meldgaard's contention. The Dorset culture of Newfoundland possibly "smells of forest," because it was, in fact, in a transitional forest zone there, and I see no reason why it should not have utilized the woodland resources available to it. However, I am not satisfied that there is any firm evidence that its inventory included those heavy stone tools, such as ground and polished adzes and gouges, which archaeologists customarily interpret as wood-working implements. The other side of this coin is the apparently strong development of littoral hunting practices among the early Indian tribes of the St. Lawrence region. The importance of fishing and seal-hunting there during the contact period is noted by Hoffman (1961, p. 201–11), and such pursuits are also known to have dated back into prehistoric time (cf. de Laguna, 1946, p. 117–19). So it is obvious that the Eskimos have not always had a monopoly on the exploitation of the food resources in the sea.

Of course, such a mixture of statement and conjecture does not explain away the problem. There is a clear need of a more exact identification of the specific cultural factors and complexes that have been observed in this region in order to appreciate the degree of fundamental likeness between them and the relative importance of cross-cultural contact and diffusion. My current program of field research in Newfoundland will, I hope, lead to a thorough clarification of the Dorset occupation there, but in the meantime I believe there is enough evidence at hand to establish the essential character of that culture (Harp, 1951, 1952). In my opinion, perhaps its strongest attribute is its obvious derivation from, or affinity with, the Arctic Small Tool tradition (Irving, 1957, p. 47), and with that criterion one can easily distinguish all Dorset materials found around the Strait of

Belle Isle. Arbitrarily, then, the Dorset sites there can safely be ruled out of consideration in this report. The residue of all other local archaeology that I know of will be described in this report.

My investigations were carried out on both the Labrador and Newfoundland shores of the Strait of Belle Isle (Fig. 1). The first season's work in 1949 has already been published in preliminary fashion (Harp, 1951), but in the interest of summarizing and correlating all existing non-Dorset culture there, it will be necessary to repeat portions of that treatment. Additional work done in the same area in 1950 and again in 1961 has not been published.

It should be emphasized that these operations were primarily exploratory, and in a few instances I did not have sufficient time for detailed checks and controlled excavations. Once located, sites were carefully surface-hunted, photographed, and sketch-mapped. In some cases it was possible to trace surface finds to a buried culture-bearing horizon, and limited test excavations were then made. Special features, such as possible hearths and workshop areas, were investigated more thoroughly. None of the sites, however, contained any positive evidence of former dwellings, although some unquestionably were the result of extensive occupations. Whenever it was deemed to be of possible significance, site elevations were measured with a hand-held levelling tube. Both sides of the Strait are marked by a series of raised terraces, presumably wave-cut benches, and the prehistoric cultural remains occurred on several of these at various heights from 15 to 140 feet above present sea-level. However, although the physical signs of post-Glacial upwarping are thus clear, positive correlation of archaeological finds with specific terraces, *qua* active beach lines, is not possible in most cases.

One rather sad truth must be recorded. In 1949, when a goodly portion of these collections was made, the Carbon-14 dating technique was in its infancy, and I was not aware of its full potential. Hence, all small charcoal samples were scorned, no large ones were encountered, and nothing was done about buried turf horizons. In 1961 I was able to compensate for some of this earlier lack of sophistication by collecting nine datable samples of charcoal and peat in several of the important Labrador sites.

Aside from a small series of representative types retained in the Dartmouth College Museum, materials discussed in this paper have been turned over to Memorial University of Newfoundland, St. John's. Collections obtained in the vicinity of Blanc Sablon, P. Q., have been forwarded to the Service d'Archéologie, Ministère des Affaires Culturelles, Province de Québec.

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The research of 1949, 1950, and 1961, described in this paper, was generously supported by the Arctic Institute of North America and further aided by several supplementary grants from the Research Committee of the Faculty of Dartmouth College. In the field I was ably assisted by the following Dartmouth students: Stearns A. Morse '52, Steven W. Kimbell

'62, Timothy G. Bissell '64, and Throop C. Brown, Jr. '64. My wife was also a highly valued member of the field parties in 1950 and 1961, and two of our boys, Jack and Geoffrey, have each contributed to the investigations in those years.

In 1949 David Nutt, owner and Master of the Arctic research schooner *Blue Dolphin*, furnished transportation and support in the area, and through the years I have also become indebted to numerous friends in Newfoundland and Labrador. No community that I have ever entered there has failed to offer its immediate help, hospitality, and friendship. I wish there was space to name each and every individual, but I cannot fail to single out for very special thanks the late Charles S. Curtis, M.D., Chairman of the Board of the International Grenfell Association, and Dr. and Mrs. Noel F. Murphy of Corner Brook.

This paper was completed under a professional service contract with the National Museum of Canada, and I am especially grateful to William E. Taylor, Jr., of the Archaeology Section of that institution, for the many ways in which he has aided my research interests.

THE SITES

LABRADOR

On this coast my coverage extended from Blanc Sablon, P.Q., northeastward for approximately 40 miles to Black Bay, Labrador. These points bracket the easiest bridgehead to Newfoundland, and, with reference to my special interest in the archaeology of Newfoundland, I have always assumed that the movements of aboriginal people to the island occurred mainly in this section of the Strait. The shortest crossing lies between Point Amour, Labrador, and Flowers Cove, Newfoundland, a distance of 9.5 miles, and on clear days there is excellent visual contact across the Strait.

When approached by sea this part of Labrador presents a rugged and formidable appearance. Barren hills and rocky headlands rise steeply from the beaches to elevations that range from 200 to 600 feet, and from such heights the land lifts more gently toward eminences of 1,000 feet in the near interior. Primarily because of the influence of the cold Labrador Current, which here trends southwestward into the Gulf of St. Lawrence, the coastal zone is a semi-Arctic tundra (cf. Tanner, 1947, I, 359–60). The most suitable habitation places are found in the bays at the mouths of several streams that dissect the bluffs, and within the shelter of these valleys there is some stunted coniferous forest. In uninhabited Black Bay the forest advances thickly almost to the outer shoreline, but in other valleys which have been rather extensively settled in historic times this forest has been heavily exploited for fuel and building materials. This development is an outgrowth of the European-type 'dry' cod fisheries that have been commercially practised on the Strait of Belle Isle coast since the early 16th century (cf. Hoffman, 1961, p. 201, *et seq.*). Such denudation of the valley lands, however, has contributed much to archaeological discovery, for this is a region of strong and constant winds, and severely eroded sand barrens are a notable feature in all such places.

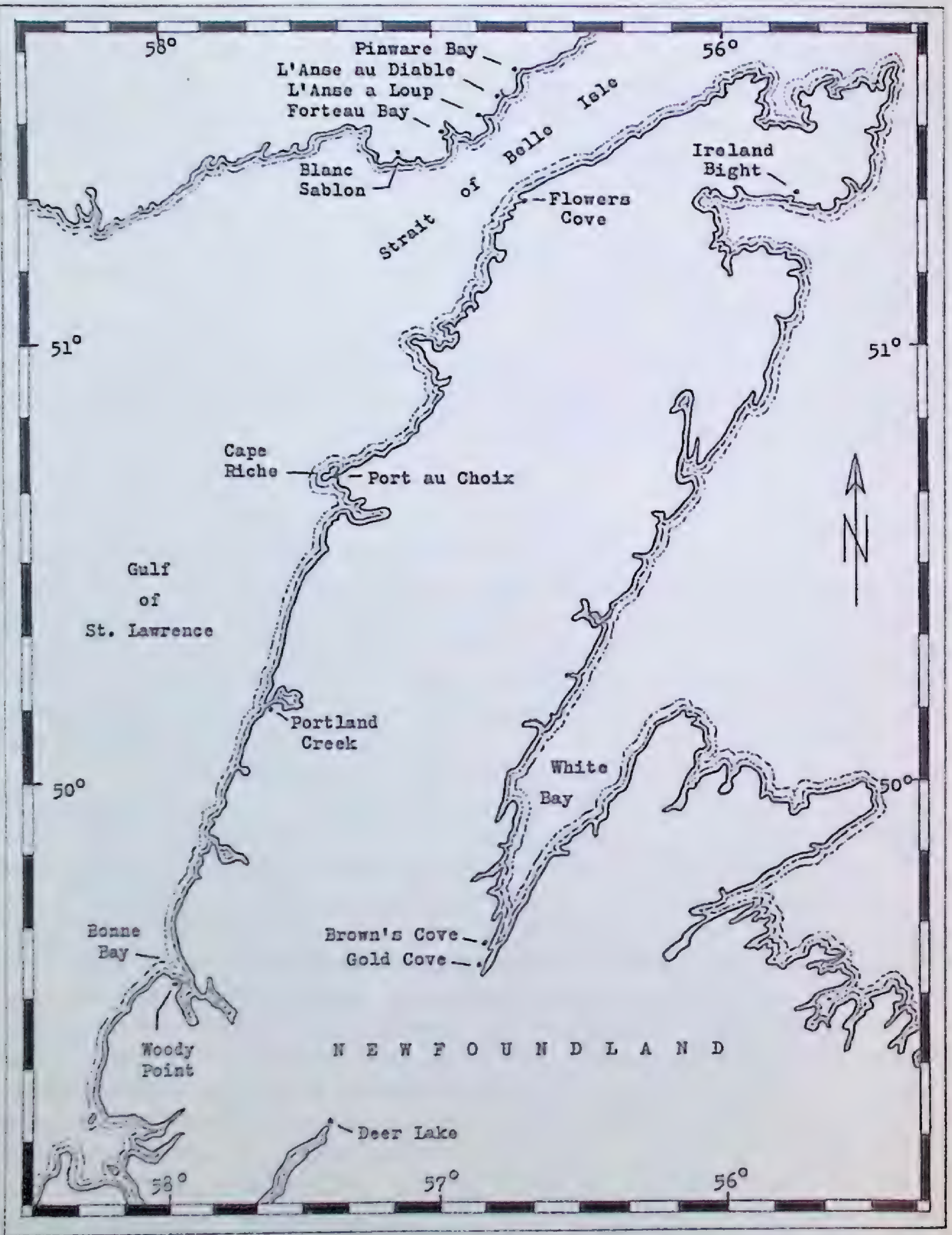


FIGURE 1. General area map.

In the following descriptions, major site areas will be listed from west to east without regard for chronology of investigation. Within each area, as determined by a bay or a contemporary settlement, the sites are ranked according to the local order of discovery, and the use of initial letters or other abbreviations to identify them will be explained as the need occurs. All location coordinates are based on various charts of the Hydrographic Office, U. S. Navy, and the H. O. number is listed for each set of locations. The dates of my investigations are also given in each case.

Blanc Sablon Bay (Figure 2) and the settlement of the same name lie immediately west of the Labrador border in the Province of Quebec. To the north is a wide, flat, marshy valley which is drained by the River Blanc Sablon; the mouth of the river is a tidal estuary. To the west of the stream is a single prominent hill about 350 feet high, and the east side of the valley is bordered by a row of steep hills of the same average height. All sites that I discovered here are designated by the initials *BS*, and they lie within the valley or on various shoulders of the large western hill. Locations were determined from H. O. 2683. Investigated in 1961.

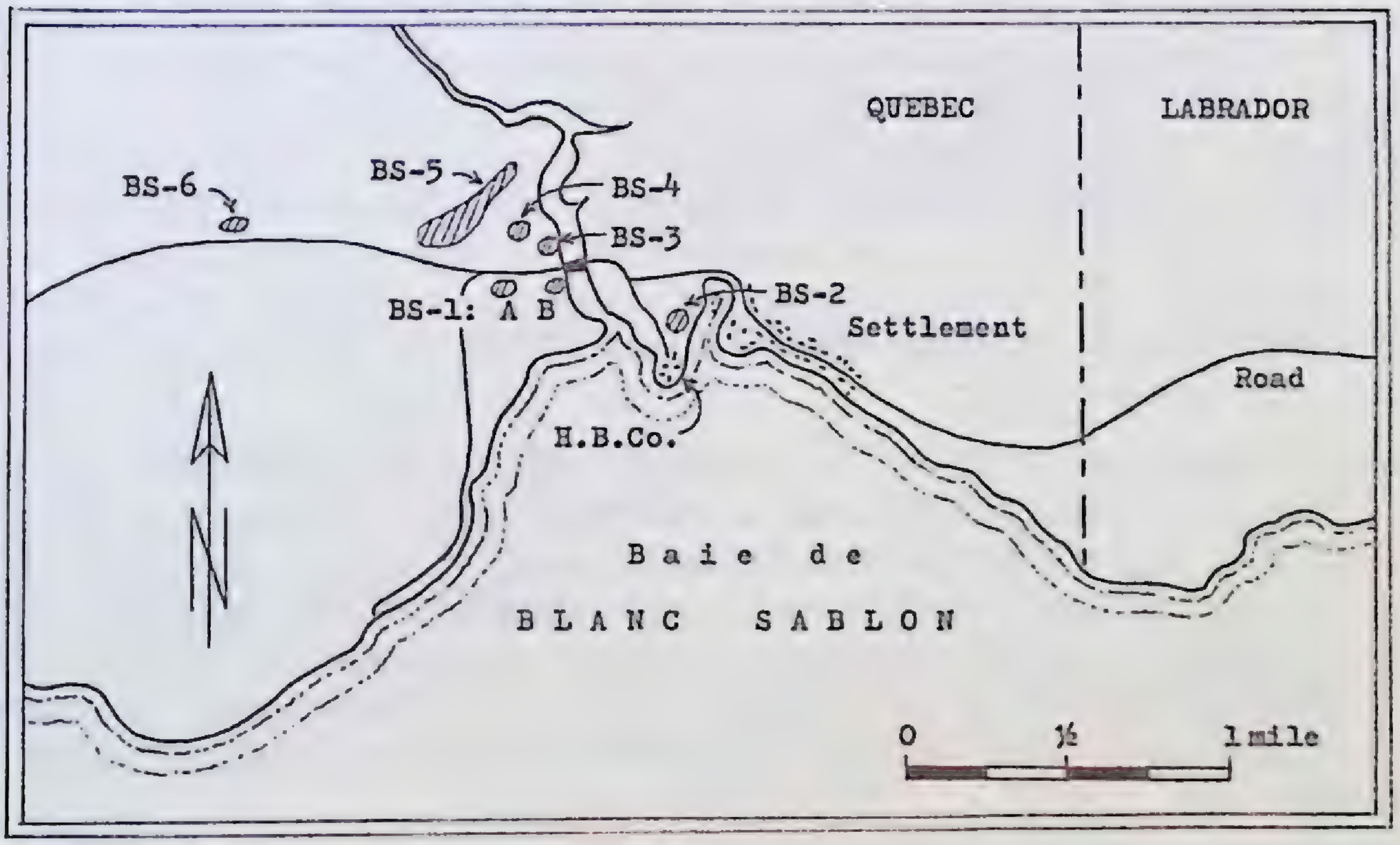


Figure 2. Blanc Sablon, P.Q.

BS-1: Centred at 51°25′42″ N, 57°08′58″ W, on the west side of the river and south of the road, but covering an area approximately one-eighth of a square mile in extent. The terrain, which is part of the gentle slope of the large hill to the west, is terraced by several raised beach-lines varying from 15 to about 30 feet above sea-level. The sandy surface of the terraces is ridged by a series of poorly stabilized dunes.

There are numerous blowouts which were liberally strewn with chipped stone cultural debris. Two profiles were excavated for control purposes (Fig. 7), and each yielded chips, artifacts, and charcoal samples *in situ* in a buried soil horizon. These profiles are designated as (A) and (B) in Figure 2 and will be further explained in a later section. In terms of elevations within the site, there was a noticeable differentiation in the distribution of the stone raw materials: in the lower portions, bordering the river and 15 to 20 feet above it, all chips and artifacts consisted of pink or reddish quartzite; above that level the predominant cultural material was grey chert. No special features or positive evidence of dwellings were observed in the site, although excavation of profile (A) did expose a lens of burned and heat-spalled sandstone rocks intermixed with a heavy concentration of charcoal. Because this occurred within a small hummock in a blowout it could not be thoroughly explored, but I had a strong impression that here were the remains of a hearth, or perhaps a sweathouse.

BS-2: 51°25′36″ N, 57°08′20″ W, on the elongated red granite outcrop directly behind and north of the Hudson's Bay Company's establishment. This knoll is bounded on two sides by the sea, and by low, marshy ground to the west and north, a fact which suggests that at one time it was a small offshore island. Its surface is mostly barren rock, but numerous sand-filled hollows support a meagre cover of mosses and lichens. A few quartzite artifacts and scrap chips were discovered in these soil pockets as well as in the thin dunes around the periphery of the knoll. At the extreme northern end of the outcrop a small concentration of Dorset Eskimo flints was found; this was manifestly separate from the other materials, and it will not be discussed further in the present report.

BS-3: Centred at 51°25′48″ N, 57°08′51″ W, on the west side of the river about 150 yards north of the road bridge. The terrace here is 15 feet above high tide line in the estuary, and dense concentrations of red quartzite artifacts and scrap occurred in the blowouts. One standing hummock was excavated for a control profile (Fig. 7). The cultural materials in this site appeared to link with the lower elevations of BS-1 in a more or less continuous distribution along the edge of the river.

BS-4: 51°25′50″ N, 57°09′01″ W, the location of a control profile excavated in the 30-foot terrace, 200 yards west of the river and about one-quarter mile north of the road. A small collection of chips and artifacts was trowelled from a buried turf line 18 inches below the present ground surface (Fig. 7). In this portion of the general site area, the quartzite materials extended from the river bank up to the 30-foot terrace, and the transition to flint and chert occurred at that level.

BS-5: Centred at 51°25′55″ N, 57°09′11″ W, along the crest of a ridge on the north side of the road, about one-quarter mile west of the river and 80 feet above sea-level. This ridge is a shoulder of the large hill that borders the valley on its west side. The crest is gently rounded, littered with boulders, and spotted with lichen and dwarf birch. Chert flakes and a few artifacts were scattered thinly over the entire upper level, and, although several depressions along the east edge of the ridge faintly suggested oval house pits, the distribution of chipped stone debris did not corroborate this possibility.

BS-6: 51°25′50″ N, 57°10′12″ W, about one mile west of the river and on the north face of the hill at an elevation of approximately 100 feet above the valley floor. This side of the hill drops off in a steep bluff, and along the duned crest of the bluff are three clusters of blowouts spread across a distance of about 500 yards. Several of these contained a mixture of chert and quartzite chips, and in one spot several specimens were obtained by excavation. These were situated in mixed sand and gravel at a depth of 10 inches, but they were not associated with any buried turf line.

Forteau Bay (Figure 3), about 5 miles east of Blanc Sablon, is the first major embayment on the southern coast of Labrador. It is bordered by hills that rise steeply to 500 feet, and into its northwest head there flows an excellent fishing stream, Forteau Brook, which drains from the country through a series of ponds. The present-day settlement occurs around the general area of the brook mouth, as well as along the west side of the bay where somewhat safer anchorages are possible for modern

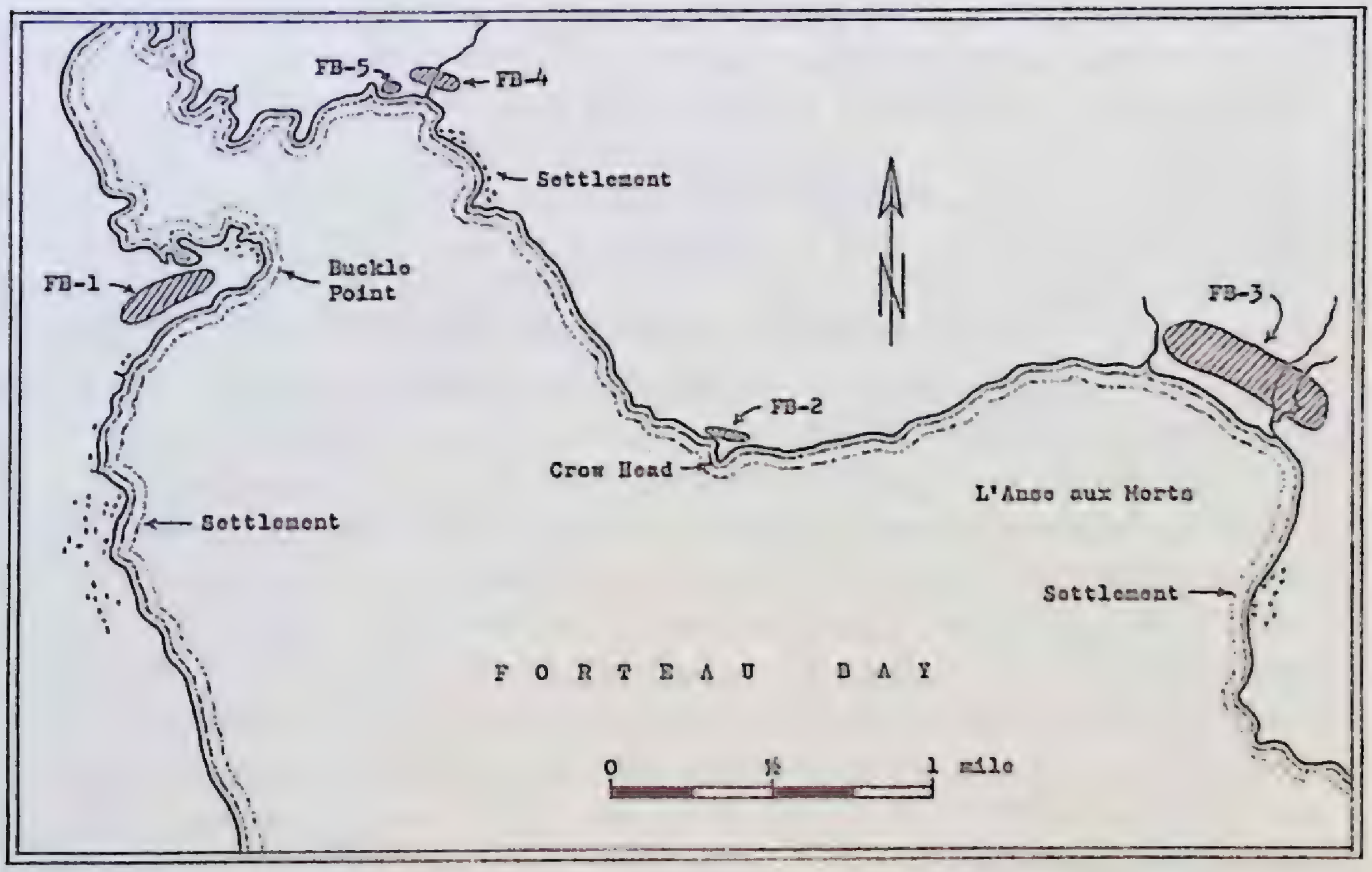


Figure 3. Forteau Bay.

vessels. Another deep and well-protected cove, L'Anse aux Morts, is situated on the north shore near the eastern extremity of the bay. Scrub fir and spruce cover the hillsides, particularly on protected lee faces, and larger timber is available a few miles distant in the interior. Forteau Bay represents in many aspects the most desirable habitation spot on this section of the Labrador, and, because it lies at the narrows of the Strait of Belle Isle, I believe it was probably the most important bridgehead to Newfoundland in the prehistoric period. The extensive nature of the archaeological sites there, especially in L'Anse aux Morts, tends to support that contention. All site locations have been determined on H. O. 2684, and they are subsequently designated here as the FB series.

FB-1: 51°28′48″N, 56°57′40″ W, along the central neck of Buckle Point, at the bottom, or north end of the bay. Investigated 1949 and 1961. This site occurs in a series of sand barrens that covers all of Buckle Point except for the rock knoll at its extreme tip, where a small present-day settlement stands. Behind the point, to the north, lies a tidal pond into which Forteau Brook flows; hence the entire neck is exposed to the strong winds which funnel in and out of the bay and the river valley, and the sand-covered neck is heavily and erratically duned and pocked with blowouts. The south face of the point is ridged concentrically above the bay shore with a number of minor raised strandlines, but a major break at about 20 feet above present sea-level is indicated by profile measurements. The highest dunes, along the spine of the point, average 40 feet above sea-level. All the cultural finds occurred in the zone between the front of the 20-foot terrace and the uppermost dunes and were clearly concentrated along the 40-foot level. Because of the constant erosion throughout the entire area of the site, most of the archaeological specimens were found on the surface. Moreover, it was difficult to determine their former relationship to the complex soil profiles. In many places exposures of chips and artifacts occurred on blown-out surfaces from 1 to 6 inches below the uppermost cover of mosses and lichens, but elsewhere this depth varied to as much as 2 feet, and, finally, several of the buried turf lines would occasionally coincide with the contemporary ground surface. Beneath the dune systems there was a gradual transition to coarse, red, waterlaid sand, and this, as far as I am aware, was completely devoid of cultural remains. In 1949 a small profile was excavated on the west shoulder of the settlement knoll at the end of the point: artifacts and chips occurred *in situ* at the base of a buried turf (Figure 7) together with a few fragments of charcoal. The charcoal sample proved too small for dating purposes, and no sample of the turf was taken. In 1961 I succeeded in finding one small concentration of chips and charcoal lying on top of a blown-out turf in the area of the upper dunes. An adequate sample of this was collected, but there is some doubt that the chips were positively associated with the turf, for they may have migrated down to that level during some past or recent erosion cycle.

FB-2: 51°28′25″ N, 56°55′17″ W, at Crow Head on the northern shore of the bay. This site, consisting of a linear complex of seven stone-slab house foundations, was first described by T. G. B. Lloyd in 1873 (Lloyd, 1875, p. 39–41), and I was able to investigate it in 1949 and again in 1961. My observations corroborate Lloyd's, although the foundations that he detailed had slumped rather badly in the intervening years. At least two of them had been modified for use as duck blinds or seal-hunting camps by the local inhabitants. One peculiar feature of dwelling No. 4 in Lloyd's series had apparently escaped earlier notice. This ruin is approximately oval in outline, with interior diameters of 10 and 17 feet, and its longer axis is oriented northeast-southwest. It seemed that the former entrance had been in the southwest end, facing the bay, and in the opposite, northeast, wall there is a narrow tunnel at ground level. This section of standing wall is 4 feet high and averages 4.5 feet thick at its base. The tunnel penetrates the base and measures 52 inches long, from the interior to the outside, 13 inches wide, and 18 inches high. Whereas the general wall construction is a coarse layering of sandstone slabs, the tunnel itself was carefully built with clean, square walls and a roof of flat slabs. Its function is unknown, for it is obviously too small for use as a passageway by human beings.

In fact, the positive identification of this entire site remains questionable to this day. According to Lloyd's informants, 'graves' had been found in these structures, but there is no documentary report or description of such an occurrence. In 1961 we had sufficient time to clean out and partially excavate five of the seven foundations. This operation consisted of clearing away the slab rock that had caved into the interiors and trowelling out the thin cover of moss and lichen that had accumulated on the gravel floor surfaces. Nothing was found except a small fragment of a clay pipe stem. Thus, although these ruins could have been Eskimo winter houses, there is no occupational debris to support that possibility. They could as well have been constructed by non-aboriginal or Caucasoid seal hunters, for this is a well-known and productive sealing ground.

FB-3: Centred at 51°28′35″ N, 56°52′52″ W, in L'Anse aux Morts (Fig. 3). This site was visited and surface-hunted in 1947 by A. H. Mallery of Washington, D.C. (Junius Bird, pers. comm.), and I went there for limited investigations both in 1949 and 1961. The locale is by far the most extensive prehistoric occupation site that I have ever seen in southern Labrador or in Newfoundland, except perhaps the large Dorset Eskimo site that I am currently excavating at Port au Choix, Nfld. As Byers has noted (1962), FB-3 is undoubtedly the equivalent of Site No. 8, Anse L'Amour, in Mallery's unpublished series. I simply prefer what appears to be the older name, L'Anse aux Morts.

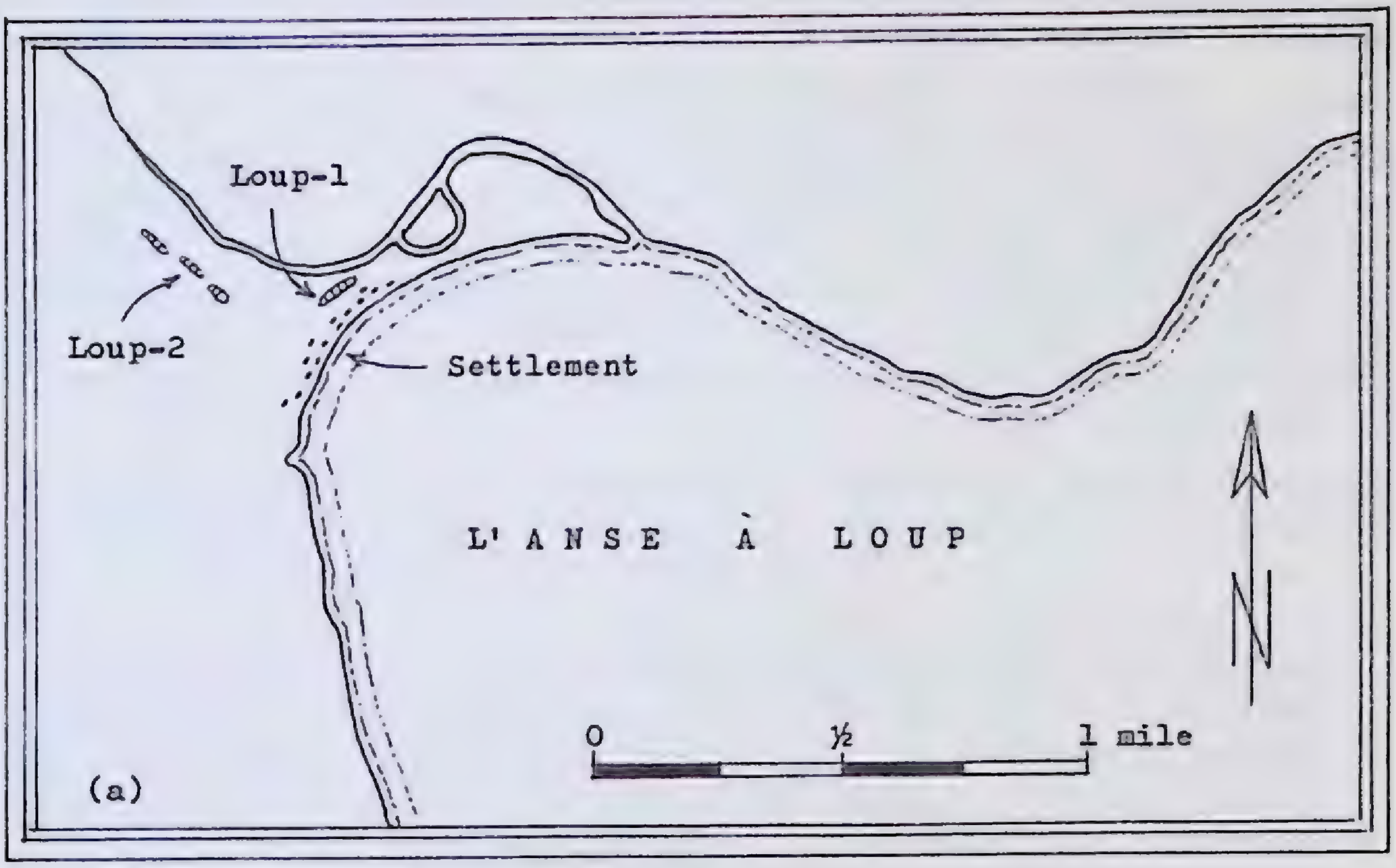
Two small brooks flow into the cove and bracket the major concentration of the site, although some materials were found eastward up to the base of the bordering hills. The entire site encompasses between 75 and 100 acres. Unfortunately, however, this is an area of sand deposition, extensively duned and deeply scarred by blowouts, and most of the archaeological specimens were collected from the surface. Characteristically, the materials were heavily patinated, and no organic debris or specimens were found. As in FB-1, this site is traversed by a series of raised beach lines. Because of the aeolian reworking of the surface deposits, these could not be plotted in detail, but it was observed that major terrace fronts occur at approximately 23 and 40 feet above present sea-level and hence equate with the general beach profile of FB-1. Also the major portion of the site was concentrated on the 40-foot terrace, as in the case of FB-1.

In some of the blowouts, chip trains could be traced back and upward to buried turf lines, and three profiles that yielded specimens *in situ* and adequate charcoal samples were opened by test excavations. Over most of the site the major occupation layer appeared to be the first major turf line beneath the present surface. This, measuring from 2 to 6 inches in thickness, was covered by varying amounts of sandy overburden, up to 24 inches. In the central portion of the site, however, the above turf was sterile in some places, and excavation showed that the culture horizon lay in a still deeper stratum of peat, 3 to 4 feet below the contemporary surface (Figure 7). Although FB-3 has produced a considerable wealth of evidence in the form of artifacts and a wide variety of types, there were no signs of dwelling sites. Unfortunately, too, I doubt that the site would repay systematic excavation, for all the significant concentrations of cultural materials seemed to occur in the most deeply eroded areas.

FB-4: 51°29′25″ N, 56°56′30″ W, at the north end of the bay, along the east and west banks of the brook which runs down from the most prominent gulch in the bordering cliffs. Discovered in 1961. A sizable scattering of weathered chert and quartzite flakes and specimens lay on the surfaces of blowouts here, and test excavations proved that the material originated in the primary buried turf line, now covered by 6 to 8 inches of weakly stabilized dune sand. The general elevation of this site coincides with that of the FB-1 and FB-3 occupations.

FB-5: 51°29′24″ N, 56°56′45″ W, on the tip of Red Rock Point, at the north end of Forteau Bay. A small concentration of Dorset Eskimo flints discovered here in 1961 will be discussed in a later report.

L'Anse à Loup (Figure 4-a) lies about three miles northeast of Forteau Bay. It is surrounded by high plateau country which drops rather steeply to the sea on all sides of the cove. A river that drains from a series of lakes in the back country enters the head of the cove, and the present settlement is distributed along the beach to the west of its mouth. A. H. Mallery visited this place in 1947, and I had one afternoon there in 1949.



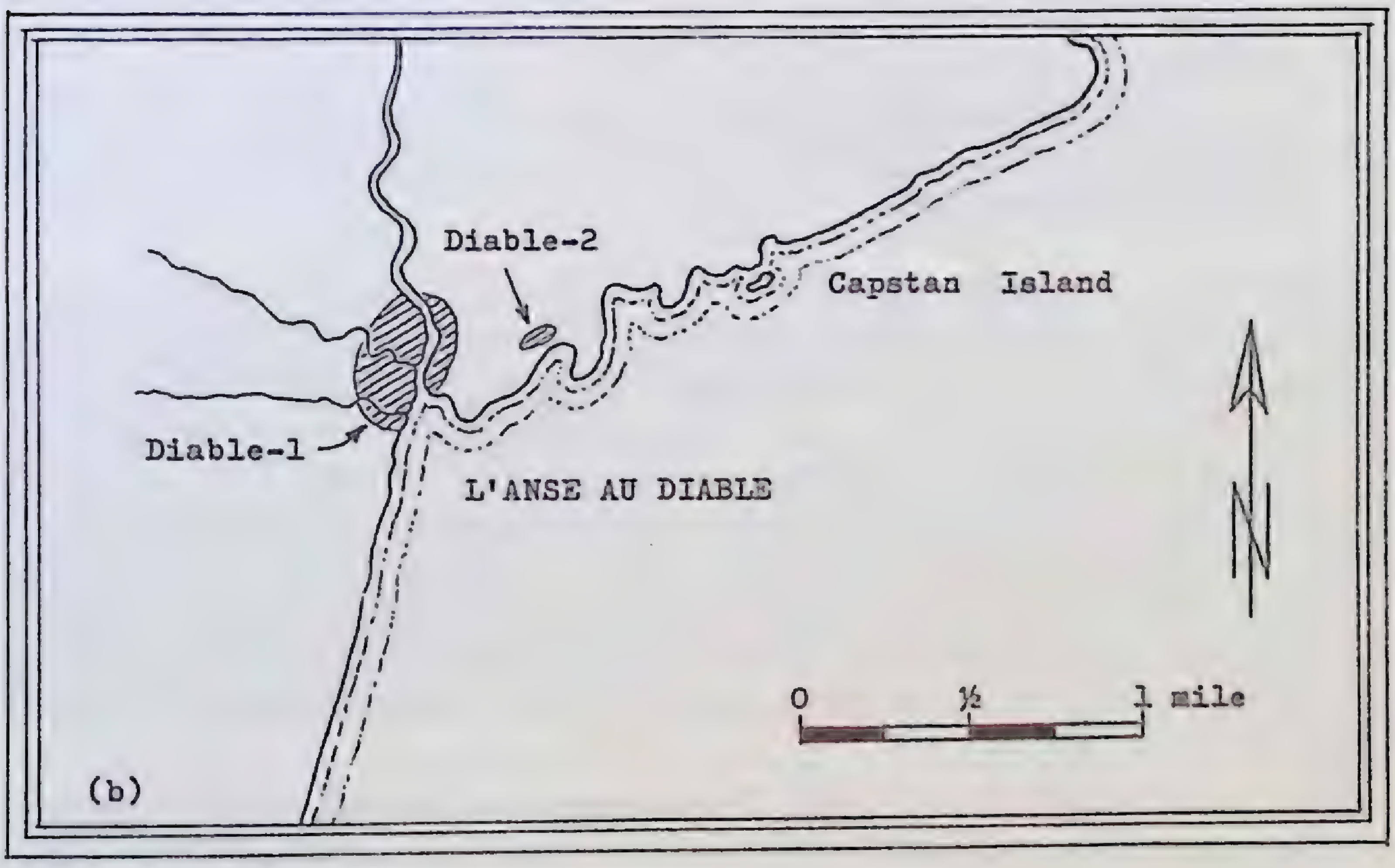


FIGURE 4. (a) L'Anse à Loup; (b) L'Anse au Diable.

Loup-1, the first of the two sites that I investigated, is apparently the one in which Mallery made his collection. Loup-2 was unknown before my arrival.

Loup-1: 51°31′22″ N, 56°48′22″ W (H.O. 2064), in the sand barrens directly behind the settlement. This may have been a large prehistoric occupation, but I suspect most traces of it have been destroyed by severe erosion and the establishment of the modern settlement. Some of the local inhabitants told me they had picked up many specimens in the past, but at the time of my arrival there were few surface indications left. The site is 40 feet above sea-level, the same as the major Forteau Bay sites.

Loup-2: 51°31′24″ N, 56°49′15″ W (H.O. 2064), high on the hillside south of the river, and about one-quarter mile inland from the head of the cove. It is located on a fairly level wave-cut bench which is now 105 feet above sea-level. There were stable dunes along the front of this bench, and the site was discovered in one mound of these that had been blown out in a 50-foot circle. The entire surface of this and adjoining blowouts were covered with literally thousands of scrap chips and a liberal mixture of artifacts. It was one of the largest workshop areas that I have ever seen, and all the material was quartzite. Test excavation showed that the site debris was deposited in the uppermost 2 inches of the dune sand beneath a sparse cover of lichens and grass (Fig. 8), and a chip trail led from this area down to a lower bench, still behind the settlement and 70 feet above sea-level. There was no other exposed evidence of occupation on either of these levels, and brief exploration in the vicinity did not disclose the source of the quartzite raw material used there.

L'Anse au Diable (Figure 4-b) is a very shallow bight in the coastline about 2.5 miles northeast of L'Anse à Loup. It is rather closely hemmed in by red sandstone cliffs, up to 400 feet high, except for one wide, shallow valley through which a brook drains. The escarpment south and west of the brook mouth is a well-known local landmark called 'The Battery.' A small cluster of fisherman's dwellings is situated around the mouth of the main brook in an area of sandy barrens. Lloyd visited this place (1875, p. 41–2) and obtained a few artifacts in the vicinity of the site I have named Diable-1. From a base camp at West St. Modeste, I investigated this section of coast on several occasions during the summer of 1949. Location coordinates are based on H.O. 1105.

Diable-1: 51°33′35″ N, 56°45′20″ W, primarily centred on the west side of the main brook, about one-quarter mile from the sea beach. The entire valley floor here is sand-filled and studded with granite outcrops. In the area of the site itself there is a large, high complex of dunes, now deeply pitted with blowouts, and the brook appears to back up there at times of extreme high tides. Through the dunes runs a single turf horizon, 4 to 6 inches thick, which is buried at varying depths up to

6 feet, and all the archaeological material seemed to originate in that zone. Nothing was located *in situ*, but several trains of chips could be traced back up to the line of the buried turf. In the area of its major concentration the site is 40 feet above sea-level.

Diable-2: 51°33′32″ N, 56°44′30″ W, about a mile east of Diable-1. This small site was discovered directly in the foot trail between Capstan Island and L'Anse au Diable, facing on a shallow cove within the same general valley mouth as Diable-1. Here, as in other nearby places, one could see the single major turf horizon, 4 to 6 inches thick, now appearing as the contemporary surface, and again being buried beneath stabilized dunes. Although found on the surface of the blowouts, all the archaeological materials quite evidently derived from this turf zone. The elevation of this site was not measured, but it is approximately the same as Diable-1, 40 feet above sea-level.

West St. Modeste is the name of a settlement about 3.5 miles north of L'Anse au Diable (Figure 5). It was at one time the seat of a French seigneurial grant, made about 1730 and known as Grande St. Modeste. This section of the coast rises quite steeply from the beach, and, in consequence, there are very few habitation spots close to the shore or at sea-level. As far as I am aware no archaeological reconnaissance had ever been carried out in this area before my visit there in 1949. However, Lloyd (1875, p. 41) was told that there were stone structures, similar to those at FB-2, in the vicinity of West St. Modeste. I could not locate any sign of these, but three new sites were discovered and named the 'Modeste series.' Their locations have been determined on H. O. 2064. I should perhaps warn future archaeologists who may be interested in further work on this coast that a very large trash pile of 18th-century French roof tile lies at the base of the cliff near the settlement. Because it is mostly covered with sod and brush, it has a prehistoric appearance which belies the relative modernity of the tile fragments. It is possible to confuse many of these tile sherds with Indian earthenware pottery.

Modeste-1: 51°35′55″ N, 56°41′22″ W, about one-half mile northeast of the settlement. Situated on the flat crown of a hill 103 feet above sea-level. The general site area is about one acre in extent, fronting directly on the sea, backed by the mountain slope, and otherwise ringed with granite outcrops. Its surface is a mixture of bog patches, cotton grass, and low sand dunes which are pocked with shallow blowouts. On the surface of the blowouts were thousands of quartzite chips and artifact fragments fully as great in numbers as the Loup-2 workshop site. Test digging indicated that all of this material derived from the 1- to 6-inch layer of turf that covered the site (Figure 8). To have acquired such a concentration of material, this site must have been a manufacturing centre over a long period of time, yet we could not locate any major source of quartzite raw material in the vicinity. No other features were observed.

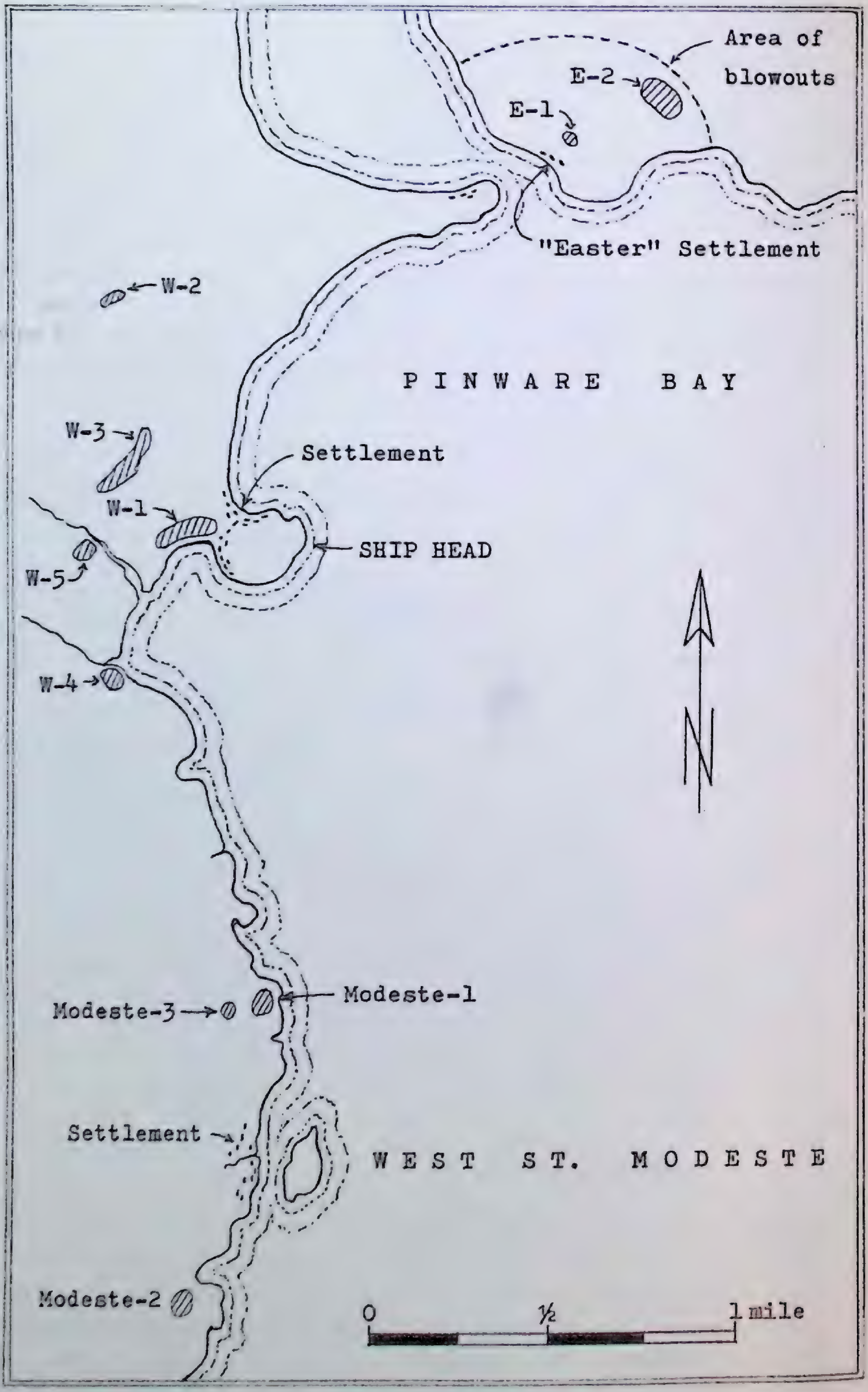


FIGURE 5. West St. Modeste and Pinware Bay.

Modeste-2: 51°35′10″ N, 56°41′41″ W, on the foot trail between West St. Modeste and L'Anse au Diable (Figure 5). The site area is on a flat, possibly wave-cut bench that extends across the face of the hill, and it measured 41 feet above sea-level. Chips and specimens were scattered thinly along a 30-foot section of the trail, and test excavation in an undisturbed area produced other material *in situ.* This appeared to be a relatively small occupation, to judge from the variety of types found, although there were no traces of hearths or dwellings. The profile, however, suggested an earlier occupation than most of those described above, for here the culture was found deposited directly on top of coarse beach gravel, at least 12 inches below the present surface turf, and covered by a substantial layer of apparently water-laid sand (Figure 8).

Modeste-3: 51°35′54″ N, 56°41′30″ W, about 250 yards inland from Modeste-1 and at approximately the same height above sea-level. This was a small camp or workshop site discovered in a blowout in the centre of the winter sled trail between Pinware and West St. Modeste. The material lay on the surface of lightly duned sand and clearly derived from the present surface turf.

Pinware Bay lies immediately north of the settlement of West St. Modeste. It is ringed by hills rising to about 350 feet, and its central feature is the mouth and lagoon of the Pinware River, by far the largest stream in the Strait of Belle Isle region. The sites I discovered extend for almost two miles around the middle portion of the bay; those lying west of the river mouth constitute the Pinware W series, and those to the east of the river are called Pinware E. Several of them occur at lower levels in the sand barrens associated with the river mouth and thus resemble in their general characteristics such locales as FB-1, FB-3, and Loup-1. Others, however, stand on higher elevations and may be equated better with the Modeste series. This area marks the northeasternmost limit of my archaeological finds on the Labrador coast, although I explored beyond in Carrol Cove, Red Bay, and Black Bay. Investigated in 1949.

Pinware W-1: 51°37′06″ N, 56°41′38″ W, on the neck of Ship Head and behind the settlement. This site was reported to me as one in which the 'old folks found many things,' but we got nothing there beyond a scattering of chips and a single gift specimen. The site area is on a rather well-defined bench 23 feet above present sea-level.

Pinware W-2: 51°37′41″ N, 56°41′58″ W, on the north face of the spur of hills that tapers down to the lagoon, and about half a mile north-northwest of the settlement. For several reasons this may be one of the most important of the Labrador sites that I investigated, although the data from it are severely limited. The hill slope is covered with boulder till and sand deposits, and it is marked by several very plain benches or terraces. The site occurs on the uppermost of these, measured 141 feet above sea-level, in the midst of a semi-circular blowout

100 yards long. The surface of the bench, as exposed in this blowout, consisted of water-rolled pebbles and small boulders, and along the deep side of the blowout, toward the centre of the hill, there was an 8-foot-thick overburden made up of water-laid sand, a buried turf line, and 3 feet of dune sand covered on top by thin heath vegetation (Figure 8). At the junction of the beach gravel and the overburden, there was a small workshop site that extended for about 10 feet. The material lay on the surface of the gravel, and excavation produced a few more chips from beneath the overburden and revealed there a hearth-like patch of sand that was flecked with tiny grains of charcoal. This appeared to be too dilute for dating purposes, and I did not collect a sample of it. My strong impression at the time was that this site positively occurred on the surface of the gravel and beneath the total overburden, although I wish that more extensive materials could have been found *in situ*. Near the other end of this same blowout, about 100 yards away from the above find, we discovered another small concentration of chips, but this had no discernible relationship with the overburden at the sides of the blowout. It is probable that these two cultural deposits, although situated in the same blowout, actually represent two different occupations that may have been widely separated in time. It should be noted that nowhere in this blowout could any signs of culture be detected either on the uppermost surface surrounding it or in the buried turf line.

Pinware W-3: 51°37′17″ N, 56°41′55″ W, on the south-facing slope of the same hill spur as Pinware W-2. This area also appeared to be a flat bench along the side of the hill, and on traverse it measured 97 feet above sea-level. There was a single turf at this elevation, which was both exposed as the contemporary surface and buried elsewhere by as much as 2 feet of dune sand. Extensive wind erosion had caused numerous blowouts and the site was discovered in these. Great quantities of quartzite chips and some broken artifacts were recovered, and their origin was traced to the turf zone. The site clearly equated with the workshop at Modeste-1.

Pinware W-4: 51°36′44″ N, 56°41′58″ W. Two brooks flow into the shallow cove southwest of Ship Head, and this site was reported to me to be on the south bank of the southernmost brook, near its mouth, at an elevation of 23 feet above sea-level. My informant told me that the Pinware settlement was formerly located there, and in the old days many artifacts had been dug up in the gardens. There were also reputed to have been some Indian graves along the brook. Our exploration of the area produced nothing.

Pinware W-5: 51°37′03″ N, 56°42′06″ W, on the south bank of the northernmost brook in Ship Head cove, approximately one-quarter mile upstream from the mouth, and also on the 23-foot bench. A small campsite, containing primarily flint materials, found on the surface of dune sand within 12 inches of the present exposed turf. This area is also 23 feet above sea-level.

The east bank of the Pinware River near its mouth is a vast area of sand barrens and blowouts covering at least one-half square mile of land. In 1949 three houses still stood in the so-called 'Easter' settlement, and one was then abandoned because it had been completely undermined by erosion. Within this area is exposed a striking series of recessional gravel beach lines and intermediate dunes which all trend in an east-west direction parallel to the coastline.

Pinware E-1: 51°38′06″ N, 56°40′08″ W, about 100 yards east of the 'Easter' settlement. This site consisted of a small scattering of quartzite chips and a core found on the surface of one of the blowouts. The elevation is about 20 feet above sea-level. It was reported to me that artifacts had at one time been found near the houses of the 'Easter' settlement, although we could find no traces of prehistoric culture that close to the river mouth.

Pinware E-2: 51°38′12″ N, 56°39′47″ W, about one-quarter mile east of Pinware E-1, and approximately the same distance north of the bay shoreline. Here the dune field seemed to pile higher toward the base of the red granite hills that border the valley on the east. There were many irregular blowouts, some of them deep pits which sank as much as 30 feet below the uppermost surrounding turf, and standing in the blowouts were a number of small mesas, or residual columns, each capped with a patch of turf or brush. These mesas presented an unusual profile (Figure 8): on top of the gravel bottoms and exposed beach ridges lay a variable stratum of varved, densely-compacted water-laid sand, interlaced with lenses of black silt; above this came a layer of fine white sand, generally two inches thick; and next, above, a thin buried turf horizon, nowhere more than two inches thick. This was capped with dune sand, varying in depth from 1 to 6 feet, and on top of that was the poorly stabilized grassy surface of the present. All the cultural finds were made in the bottoms and on the slopes of the blowouts, always below the buried turf, and none occurred *in situ.* Two concentrations of material were particularly noteworthy. One was a mass of whitened bones, six dog skulls, and grey quartzite chips scattered over a mound of sand studded with 20 to 30 granite boulders. The mound averaged 10 feet in diameter and was 3 feet high at its apex; several feet away was a pecked and ground greenstone adze. Deeper in the same blowout, but approximately 100 yards to the north, occurred another grouping of red granite boulders. These formed a 12-foot circle, and sprinkled about were a number of quartzite chips and specimens, as well as one of ground and polished slate. A train of chips led from this site back up the slope toward the buried turf layer. Elsewhere in the general area a few other small chip concentrations were noted, but time was too short to explore thoroughly the intricate mazes of these blowouts.

NEWFOUNDLAND

Generally speaking, the Boreal Archaic materials that I have from Newfoundland are much less well documented than those from Labrador. The sites that I know at first hand are widely scattered from Hare Bay and White Bay on the northeastern coast, down the western coast as far as Bonne Bay, and into the interior a few miles. In some cases artifacts were presented to me by the local inhabitants, and elsewhere I had only brief opportunities to examine a few of the sites myself. Also, to a large extent my efforts on the island have been concentrated in sites of the Dorset Eskimo culture. The Boreal Archaic sites mentioned below are listed in a general north-south pattern, regardless of the order in which I visited them.

Ireland Bight: 51°20'40" N, 55°45'48" W (H. O. 2440), on the site of the small settlement of the same name, on the northeast shore of Hare Bay. A good fishing stream enters the bay here, and the site stands on a small, semi-circular flat, sheltered by rocky bluffs, 15 feet above sea-level. The prehistoric occupation occurred in space that is now devoted to gardens and the local graveyard. Two specimens found there were given to me in 1949 by Mr. Levi Dawe and Mr. Levi Reid, but my own surface hunt was not productive.

Port au Choix-3: Centred at 50°42'20" N, 57°22'08" W (H. O. 1175), in and around the contemporary settlement of Port au Choix, chiefly on the properties of Ernest Billard, Pius Billard, Romeo Billard, the late A. S. Darby, and Walter Billard. This site was first mentioned by Wintemberg (1939, p. 85–6), who obtained several specimens from A. S. Darby. During my four summers in this area, to date (1949, 1950, 1961, 1962), I acquired considerably more material and some data from the site, but unfortunately most of these have come to me as gifts. All the finds here have been made within a radius of 200 yards from the government wharf and on the two major terraces which stand 17 and 29 feet above sea-level. A small brook flows into the bay, and, while the land around the settlement is all open now, it was thickly bushed in as late as 1910. Among the remarkable discoveries made in this area in the last twenty years have been a large cache of quartzite implements and three separate human burials with associated grave furnishings. These and other gift items are now in my possession. However, my various test excavations have succeeded in placing some of these in proper reference within the existing soil profiles (Figure 8), although they have not added significantly to the general inventory.

Port au Choix-9: 50°42'47" N, 57°24'08" W (H. O. 1175), on the outer coast of Cape Riche Peninsula. This was apparently a momentary stopping place for a single prehistoric individual, perhaps for the purpose of viewing seal-hunting possibilities from the high vantage of Black Point. Two chipped stone specimens were found together on the limestone shingle surface of the bluff above the point, but no other cultural evidence was discovered. Investigated in 1961.

Portland Creek: 50°11′00″ N, 57°36′30″ W (H. O. 2440), on both the north and south shorelines at the mouth of the river. This is presumably the site mentioned by Wintemberg (1939, p. 87), and I stopped there for brief checks in 1961 and 1962. Both sides of the stream below the road bridge are huge sand barrens with rapidly changing dune systems. A major flat occurs at about 25 feet above sea-level, and a number of chips and several specimens were collected from this surface. The material seemed to be associated with a buried turf horizon in the dunes, but no test excavations were made.

Woody Point, Bonne Bay: 49°30′45″ N, 57°55′00″ W (H. O. 2440), around the lighthouse at the settlement of Woody Point, south shore of Bonne Bay. This site was first mentioned by Wintemberg (1939, p. 89), who was told that many finds had been made there in the past. Although this material was not available for his inspection, he suggested that the site was not Eskimo because of the reputed presence of stone gouges. My own explorations in the vicinity, in 1949 and 1950, were completely unsuccessful, due, perhaps, to the extensive housing development that has occurred in recent years. However, I did obtain two specimens that had turned up in garden plots within the settlement.

Deer Lake: 49°10′45″ N, 57°25′10″ W (H. O. 2440), at the north end of Deer Lake, in the Humber River drainage, and within the confines of the settlement of the same name. According to local informants, the site was first discovered behind, or west of, the lowermost log cabin at the foot of Chapel Hill Road. In 1950 I could not find anything in this area, but I was given a single specimen dug up there some years ago by Mr. James Kennedy. The general setting is a terrace which extends around the northern end of Deer Lake at an average distance of about one-half mile from the present waterline. The flat between the terrace and the lake is swampy.

Gold Cove-1: 49°34′13″ N, 56°50′06″ W (H. O. 2366), on the east bank of the brook that drains down through Caribou Valley into the settlement of Gold Cove and White Bay. A series of three terraces extends back from the landwash and up the sides of this valley, and artifacts were found on the upper and intermediate levels, from 50 down to 30 feet above sea-level. All the material derived from the 4 to 6 inches of turf and topsoil that lay on top of coarse, water-laid sand and gravel. Investigated, together with the following two sites, in 1950.

Gold Cove-2: 49°34′17″ N, 56°50′12″ W (H. O. 2366), on the west side of the brook in Caribou Valley, but only on the 50-foot level. The sole specimen that I have from this site is a large ground stone adze given to me by Mr. Arthur Osmond. A surface hunt of the potato garden whence this came produced only a few flakes of quartzite and a crude core.

Brown's Cove: 49°38′09″ N, 56°47′24″ W (H. O. 2363), on the west shore of White Bay, about 4 miles north of Gold Cove. The habitation here, both modern and prehistoric, occurs on a terrace about 50 feet above sea-level. Within the cove the terrace slopes down rather gently to the landwash, but immediately to the north and south of the cove are steep, rocky bluffs. The high point which bounds the north end of the cove is known and still used as a lookout. On the land side of the site, wooded hills rise precipitously to 600 feet. The aboriginal remains have all turned up in the various gardens of the modern settlement which lie mostly north of the cove. I did not excavate here except to make a brief check of the soil profile. This was identical with Gold Cove-1, although in some spots an extra deposit of reddish peat indicated that the terrace had formerly been forested. My collection is made up entirely of surface finds from the garden of Mr. Henry Langford, and these are all of Boreal Archaic origin. However, there are traces of Dorset Eskimo culture at the extreme northern end of this general site area, specifically in the form of a nephrite skin scraper which Mr. Leander Osmond found there. He pointed out this particular spot to me and reported that 'hollowed out stone pots' had been found there in the old days. Yet I could find no cultural traces whatsoever, and under the circumstances I interpret these distinctly separate finds as evidence of two prehistoric occupations at Brown's Cove.

DESCRIPTION OF THE COLLECTIONS

BS-1 (Plate I: a–n). 61 specimens: 15 points, 15 knives, 7 scrapers, 9 indeterminate fragments, 4 prismatic blades, 5 blanks, 2 chopping tools, 4 core fragments. Forty-eight of quartzite, 12 of chert, and 1 of limestone.

Points: *Lanceolate:* Six specimens, as in Plate I: b–d. Although several of these trend toward a slightly broader leaf shape, the dominant characteristic seems to be the straight, parallel sides along the lower one-third of the blade. These points are bifacially worked in varying degrees of fineness, and their bases are slightly concave and thinned. Five are made of quartzite, and the single chert specimen, Plate I: c, is the most expertly fashioned of all.

Side-notched: Four specimens, as in Plate I: e, f. These are rather roughly flaked on both faces and have partial edge retouching. Four are quartzite and one is chert. Plate I: f has an offset blade.

Stemmed: Four specimens, as in Plate I: g. This type has a lanceolate blade; it is skilfully flaked on both faces with edge retouching, and the stem edges are ground. All are quartzite, but the best examples are made of the fine-grained, translucent grey variety.

Knives: *Leaf-shaped:* Seven fragmentary specimens, as in Plate I: k, l. Some of these appear to be portions of blades that are larger than the lanceolate type which follows. They are for the most part bifacially flaked. Six quartzite, one chert.

Lanceolate: Eight specimens, as in Plate I: n. These have essentially a long leaf shape with convex sides; the flaking is bifacial and coarse, and there is some edge retouching. Most of the specimens are fragmentary. Six quartzite, two chert.

SCRAPERS: *End scrapers:* Two specimens, Plate I: i, m. The first one shown is a snub-nosed variant done in flint, and the second is a thick, keeled flake of quartzite with partial edge retouching.

Flake: Four specimens, as in Plate I: h. All random flakes of quartzite, variously retouched on one or more edges.

INDETERMINATE FRAGMENTS: Nine specimens which appear to be portions of knives, scrapers, and possibly points.

PRISMATIC BLADES: Four specimens, as in Plate I: j, indicate some knowledge of blade-manufacturing techniques in this site, although no further evidence of it was noted in the artifact assemblage. Three chert, one quartzite.

BLANKS: Five specimens of pink, coarse-grained quartzite. Thick, roughly flaked by percussion on both faces. Clearly unfinished implements, probably knives.

CHOPPING TOOLS: Two specimens, not shown, appear to be hand-held chopping tools, each of which has one edge that is crudely flaked by percussion. One limestone, one quartzite.

CORE FRAGMENTS: Four specimens, not shown, are remnants of quartzite pebbles.

BS-1: Profile A. In addition to a charcoal sample and various scrap flakes of chert, one specimen was obtained *in situ.* This is a side-notched point of patinated chert, Plate I: a. It is bifacially worked and has retouched edges. Included in the general tally for BS-1.

BS-1: Profile B. In addition to a scattering of chert and quartzite chips, one fragment of a chert flake scraper was found here *in situ.* Included in the general tally for BS-1.

* * *

BS-2: (Plate I: o–t). 13 specimens (exclusive of the small Dorset collection found nearby): 2 points, 8 knives, 1 scraper, 2 indeterminate fragments. Eleven of quartzite, 2 of chert.

POINTS: *Corner-notched:* Two specimens, Plate I: p, q. The first shown is a thin flake of translucent grey quartzite that has been worked mainly on one face only; it has retouched edges, and the notches are lightly ground. The small triangular point is made of chert and is also plano-convex in cross-section.

PLATE I

Artifacts

a.	Side-notched point (p. 205)	BS-1, Profile A
b–d	Lanceolate points (p. 204)	BS-1
e, f.	Side-notched points (p. 204)	“
g.	Stemmed point (p. 204)	“
h.	Flake scraper (p. 205)	“
i.	End scraper (p. 205)	“
j.	Prismatic blades (p. 205)	“
k, l.	Leaf-shaped knives (p. 204)	“
m.	Keeled end scraper (p. 205)	“
n.	Lanceolate knife (p. 205)	“
o.	Side-notched knife (p. 210)	BS-2
p, q.	Corner-notched points (p. 205)	“
r, s.	Leaf-shaped knives (p. 210)	“
t.	Asymmetric knife (p. 210)	“

PLATE I

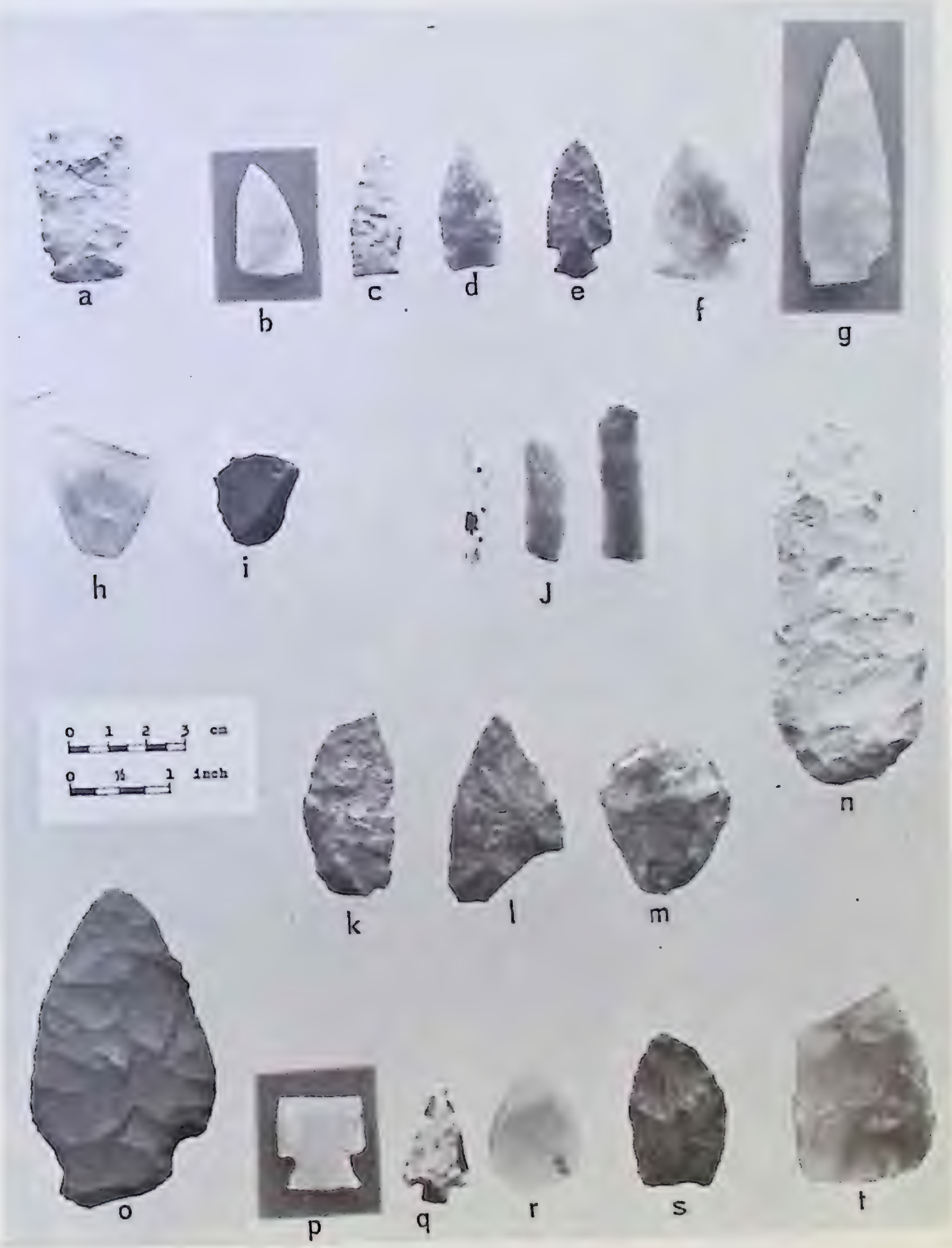
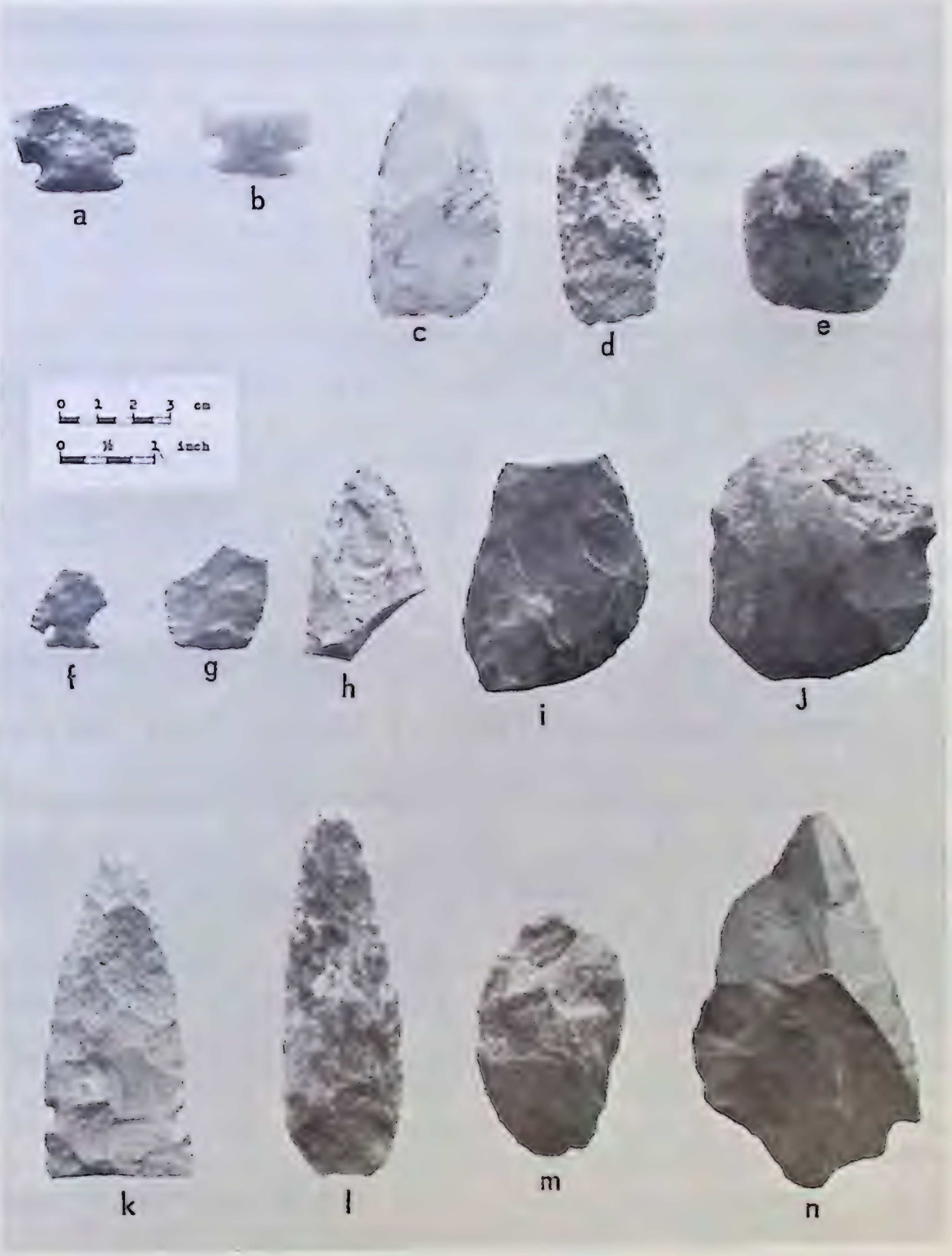


Plate II

Artifacts

a, b.	Side-notched points (p. 210)	BS-4
c.	Asymmetric knife (p. 210)	"
d, e.	Leaf-shaped knives (p. 210)	"
f.	Corner-notched point (p. 210)	BS-5
g, h.	Indeterminate knives (p. 210)	"
i.	Asymmetric knife (p. 210)	"
j.	Core (p. 211)	"
k.	Side-notched point (p. 211)	BS-6
l.	Lanceolate knife (p. 211)	"
m.	Ovoid knife (p. 211)	"
n.	Flake knife (p. 211)	"

PLATE II



Knives: *Leaf-shaped:* Five specimens, all quartzite, as in Plate I: r, s. The first one shown is a thin flake of translucent grey quartzite, shaped primarily by edge retouching. The second is bifacially worked and is probably an incomplete blank.

Stemmed: One specimen, Plate I: o. Rough bifacial flaking with edge retouching. The stem edges are lightly ground. Fine-grained quartzite.

Asymmetric: Two specimens, as in Plate I: t. Bifacially worked with slight edge retouching. Both quartzite.

Scraper: One specimen, not shown, is a flake of chert with one retouched edge.

Indeterminate fragments: Two specimens of worked quartzite.

* * *

BS-3 (Not illustrated). Two specimens: one point, two knives.

Point: One specimen in quartzite, probably the base fragment of the lanceolate type described for BS-1.

Knives: Two specimens, probable fragments of leaf-shaped type.

BS-4 (Plate II: a–e). 6 specimens: 2 points, 3 knives, 1 scraper. All quartzite, and all found *in situ.*

Points: *Side-notched:* Two specimens, Plate II: a, b. Bifacially worked, notches ground, bases thinned and straight.

Knives: *Leaf-shaped:* Two specimens, Plate II: d, e. Roughly flaked bifaces with minor edge retouching.

Asymmetric: One specimen, Plate II: c. Bifacially worked with basal thinning.

Scraper: *Flake:* One random quartzite flake with retouching across one end.

BS-5 (Plate II: f–j). 17 specimens: 3 points, 3 knives, 2 scrapers, 5 indeterminate fragments, 1 chopping tool, 2 cores, 1 gunflint. Ten of chert, 6 of quartzite, 1 of silicified slate.

Points: *Stemmed:* One fragment, not shown, of a tapered stem with a rounded base. Fine-grained quartzite. Appears to be the same as a type described later for FB-3 (cf. Plate IV: c).

Corner-notched: One specimen, Plate II: f, is pressure-flaked on both faces, essentially barbed, and made of banded chert.

Indeterminate: One tip fragment of a small point, probably lanceolate in general proportions. Quartzite.

Knives: *Asymmetric:* One specimen, Plate II: i. A large flake of chert, roughly flaked on both faces and with edge retouching.

Indeterminate: Two specimens, Plate II: g, h. Both are chert and probably represent leaf-shaped forms. The basal fragment shown is bifacially worked, has retouched edges, and its base is straight and thinned.

Scrapers: *Flake:* Two specimens of chert and quartzite with retouched edges.

Indeterminate Fragments: Five specimens. Four of chert are portions of knives and scrapers. The fifth, of silicified slate, is a small fragment probably derived from a ground and polished adze or gouge.

Chopping Tool: One specimen of quartzite, similar to those described for BS-1.

Cores: Two specimens of quartzite, as in Plate II: j.

Gunflint: One specimen, found on the surface within the general area of this site.

BS-6 (Plate II: k–n). Eight specimens: one point, three knives, one scraper, two prismatic blades, one indeterminate fragment. All quartzite.

Point: *Side-notched:* One specimen, Plate II: k, may actually have been a large end-hafted knife. Plano-convex in cross-section, although bifacially flaked. The notches are ground smooth.

Knives: *Lanceolate:* One specimen, Plate II: l, with coarse bifacial flaking.

Ovoid: One specimen, Plate II: m. A roughly made biface.

Flake: One specimen, Plate II: n. This is a large, irregular flake of fine-grained quartzite, retouched along the right-hand edge.

Scraper: *Flake:* One specimen, a spall of pink quartzite, retouched around its periphery.

Prismatic Blades: Two specimens of coarse-grained quartzite.

Indeterminate Fragment: One piece of a quartzite knife.

FB-1 (Plate III: a–n). 73 specimens: 13 points, 24 knives, 8 scrapers, 8 adzes, 1 gouge, 3 ground slate implements, 15 indeterminate fragments, 1 core. Forty-five of chert, 15 of quartzite, 11 of silicified slate, 1 red jasper, 1 andesite.

Points: *Leaf-shaped*: Three specimens, not shown, all chert. Simple blades with convex sides, bifacially worked.

Lanceolate: Four specimens, as in Plate III: f, all fine-grained quartzite. The point shown reconstructs to about 16 cm in length. It is carefully flaked on both faces with complete edge retouching and nice symmetry of plan and biconvex cross-section.

Stemmed: Four specimens, Plate III: a–d, all translucent grey quartzite. Although not all are whole specimens, this type seems to be characterized by a tapering stem with lightly ground edges. The flaking is mostly bifacial with fine edge retouching, although two were made on thin flakes and have plano-convex cross-sections.

Side-notched: Two specimens, as in Plate III: e. This is made of a large blade of andesite porphyry, bifacially flaked with complete edge retouching. Edges of notches and stem lightly ground and base thinned and bevelled by means of bifacial retouching.

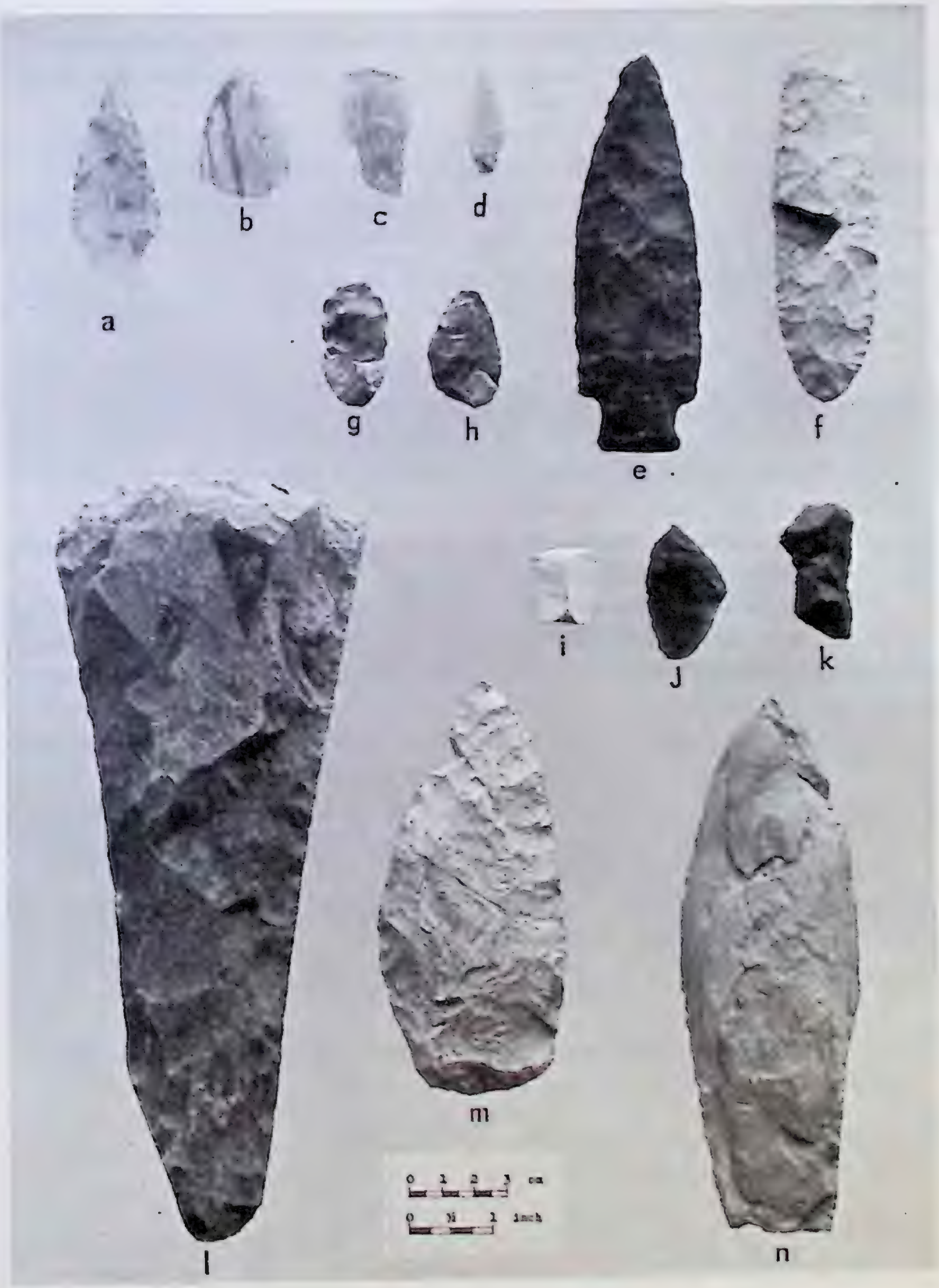
Plate III

Artifacts

FB-1

a–d. Stemmed points (p. 211)
e. Side-notched point (p. 211)
f. Lanceolate point (p. 211)
g. Ovoid knife (p. 214)
h. Asymmetric knife (p. 214)
i. End scraper (p. 214)
j, k. Amorphous flake scrapers (p. 214)
l. Triangular adze (p. 214)
m. Leaf-shaped knife (p. 214)
n. Lanceolate knife of ground slate (p. 214)

PLATE III



KNIVES: *Leaf-shaped:* 11 specimens, as in Plate III: m. This type is generally a large biface tool with rough flaking and rather coarse edge retouching.

Ovoid: Two specimens, as in Plate III: g, both chert. Small bifaces that appear to have been used as side blades.

Asymmetric: Eight specimens, as in Plate III: h. All are bifaced with edge retouching, and have round bases. The form suggests use as side blades. One fragment is quartzite, and all others are chert.

Flake: Four specimens of amorphous blades that are essentially retouched flakes. One is a spall of silicified slate, and the others are chert.

Indeterminate: Fifteen fragments which presumably belong to one or another of the above-mentioned types. Thirteen of chert, two of quartzite.

SCRAPERS: *End scrapers:* Three specimens, as in Plate III: i. All made on thin blades of chert with fine retouching across the bulbar end but no significant shaping of the blade itself.

Amorphous: Five specimens, as in Plate III: j, k. Variously shaped flakes of chert, jasper, and quartzite that have been unifacially retouched along one or more edges. Plate III: j appears to be a sort of oblique end scraper, shaped to an offset point; its lower edges are dulled, as if for hafting.

ADZES: *Rectanguloid:* One specimen, a blocky form of roughly flaked chert has a bifacially ground convex cutting edge.

Trianguloid: Seven specimens of silicified slate, as in Plate III: l. These appear to be unfinished blanks that have been crudely shaped by chipping but not yet ground and polished. They all have a plano-convex cross-section.

One additional fragment is an indeterminate type, but it resembles the form of the adze shown in Plate IX: k, for Pinware E-2.

GROUND SLATE IMPLEMENTS: One lanceolate knife, Plate III: n, has been ground on both faces. Its cross-section is biconvex with a slight suggestion of a median ridge on each face.

Lanceolate point: Two other fragments seem to derive from points like those shown in Plate VI: b–d, for FB-3.

CORE: One specimen, a block of grey chert with blade scars.

FB-2: Only one specimen was obtained from this site: a small fragment of clay pipe stem.

FB-3 (Plate IV: a–o; Plate V: a–o; Plate VI: a–e, k). 341 specimens: 34 points, 124 knives, 35 scrapers, 2 drills, 12 prismatic blades, 2 burins and gravers, 3 chipped adzes, 89 indeterminate fragments, 4 hammerstones, 5 cores, 22 ground slate points, 4 ground stone adzes, 5 gouges; 210 of chert, 95 of quartzite, 34 silicified slate, and 2 of granitic rock.

POINTS: *Lanceolate:* One specimen, Plate V: c, of fine-grained quartzite.

This is a questionable type because the specimen is fragmentary, but it resembles closely the one described for FB-1.

Stemmed: Seventeen specimens, as in Plate IV: a, c, d; Plate V: a, b; Plate VI: c; all of quartzite, predominantly the translucent grey variety. This type is bifacially flaked with a symmetrical biconvex cross-section, and the edges are completely retouched. The stems vary from those with fairly parallel sides to tapered ones; the stem bases are mostly convex, and the edges of all are lightly ground.

Side-notched: Sixteen specimens, as in Plate IV: e; also cf. Plate VII: u; and Plate VIII: u. Thirteen of this type are generally leaf-shaped, as those illustrated in Plates VII and VIII. They are bifacially flaked but plano-convex in cross-section; the bases are convex, and the notches are ground. The other three specimens constitute a slight variant, which is triangular in outline and straight-based. Twelve of chert and four of quartzite.

KNIVES: *Leaf-shaped:* Twenty-seven specimens, as in Plate IV: h, i, and Plate V: e. This type is clearly an end blade because of basal thinning, but it might also be classed as triangular because of its tendency toward square basal corners. The sides are mildly convex, and the bases vary from straight to convex. It is bifacially flaked with complete edge retouching, but the cross-section is plano-convex. One is chert, and the remainder are quartzite.

Asymmetric: Twenty-two specimens, as in Plate V: d. Most of the examples are fragmentary, but they exhibit bifacial flaking, occasional edge retouching, and slightly plano-convex cross-sections. All chert.

Ovoid: Five specimens of chert, similar to Plate III: g.

Large bifaces: Forty-eight specimens, all fragmentary, as in Plate IV: k. These are portions of roughly flaked blades, most of which suggest a semilunar form, but the type cannot certainly be identified. Forty of chert and eight of quartzite.

Flake knives: Twenty-two specimens, as in Plate IV: o, and Plate V: j, all consisting of amorphous flakes or blades that have portions of one or more edges retouched on two faces. Twenty of chert, two of quartzite.

SCRAPERS: *End scrapers:* Nine specimens, as in Plate V: g, h, k, exhibit considerable variation. The first shown is a piece of silicified slate that has been chipped down the sides but ground to an edge across the nose. The second is an end-of-blade type (h), represented by six specimens, some of which have concave scraping ends; the sides are quite parallel, and the general form is rectangular. The third (k) is more like the common steep-ended, snub-nosed variety; two specimens of this kind have been trimmed down one side and are faintly triangular in shape. Two of slate, two of granitic rock, and five of chert.

Turtleback: Three specimens of chert.

Flake: Twenty-three specimens, as in Plate IV: j and Plate V: i. All seem to be miscellaneous flakes that have portions of their edges unifacially retouched. One has a concave working edge, whereas all others are convex. Twenty-one of quartzite and two of chert.

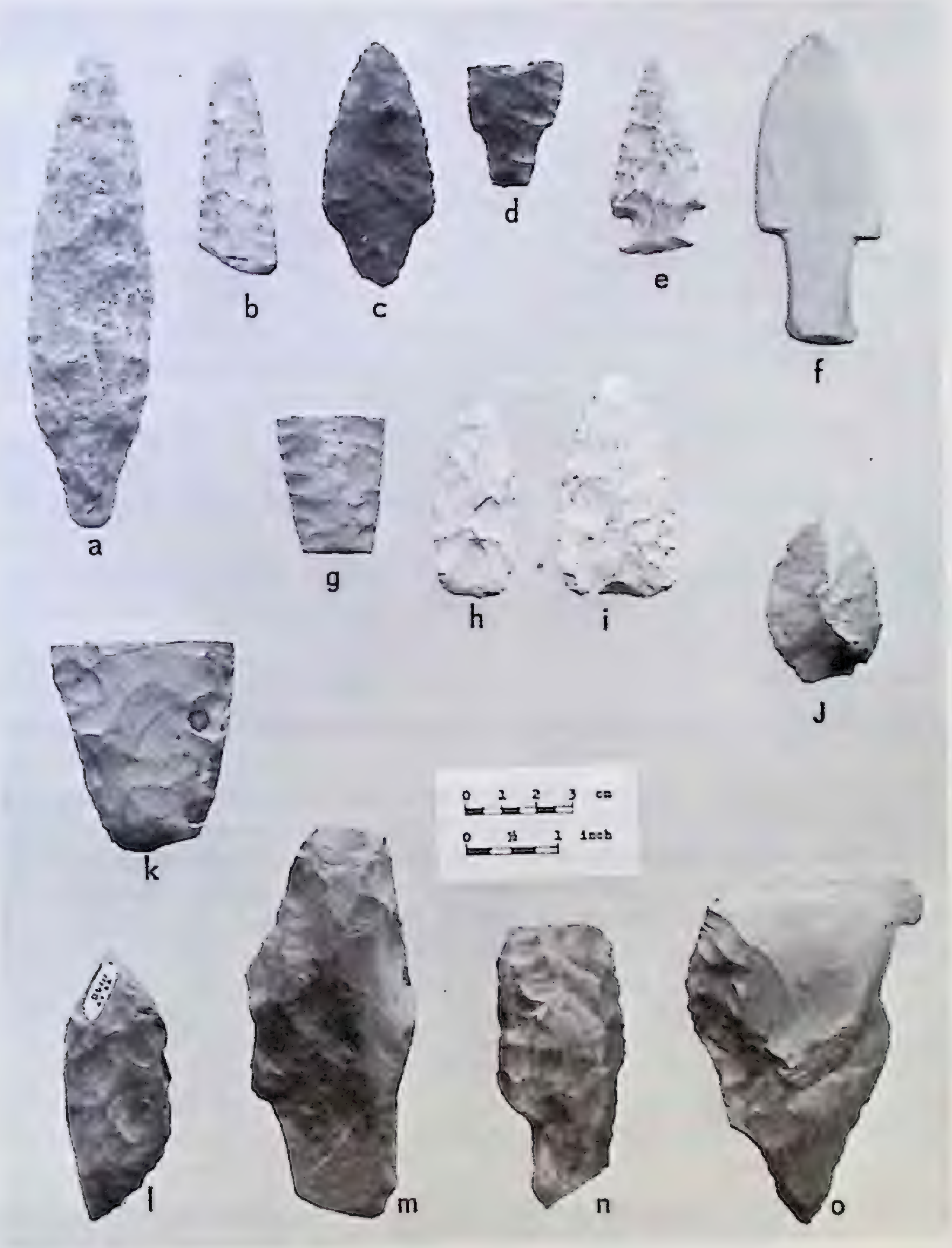
PLATE IV

Artifacts

FB-3

a.	Stemmed point (p. 215)
b.	Fragment of knife or point (p. 218)
c, d.	Stemmed points (p. 215)
e.	Side-notched point (p. 215)
f.	Stemmed point of ground slate (p. 218)
g.	Fragment of point or knife (p. 218)
h, i.	Leaf-shaped knives (p. 215)
j.	Flake scraper (p. 215)
k.	Large biface (p. 215)
l.	Possible burin (p. 218)
m, n.	Chipped adzes (p. 218)
o.	Flake knife (p. 215)

PLATE IV



Drills: Two specimens, Plate V: l, m, both chert, are irregular fragments of plano-convex cross-section that have been prepared only on the dorsal surface. The dominant feature of each is the tapering, but substantial, point which strongly suggests the drill function.

Prismatic blades: Twelve specimens, as in Plate V: n. These are all good examples of the blade-making technique, and they appear to have been struck from prepared cores. Eleven of chert and one of quartzite.

Burins and gravers: Two specimens, as in Plate IV: l. This is a questionable category because it includes only one specimen that may be identified as a burin. As illustrated, this seems to have been a broken fragment of a biface knife, but two clear burin scars show at its upper tip. One scar traces down the lateral edge, while the second faces more onto the upper surface. The effect of this latter scar has been to thin the width of the transverse chisel edge which is 5.8 mm wide.

The second specimen, tentatively classed as a graver, is a tabular piece of silicified slate, ground smooth on both faces and edges. One end has been pressure-flaked to a blunt, asymmetric point.

Adzes: Three chipped specimens, as in Plate IV: m, n. These are tabular pieces of chert, crudely flaked into rectangular bifaces. Each has a drawn-out stem, however, and at the opposite end a blunt working edge. They appear to have been hafted in a socket.

Indeterminate fragments and utilized flakes: Eighty-nine specimens, as in Plate IV: b, g, including numerous fragments of probable knives. Seventy-eight are chert and eleven quartzite.

Hammerstones: Four specimens of quartzite pebbles with abraded ends.

Cores: Five specimens, all tabular chunks bearing the scars of coarse percussion flaking.

Ground slate points: Twenty-two specimens, as in Plate IV: f; Plate V: f; and Plate VI: b–d, k. The dominant form is stemmed and is represented by those specimens shown in Plate VI. The patinated points are part of a cache of twenty found in 1961, whereas Plate VI: k, which is unpatinated, was picked up some years ago by one of the local fishermen and later presented to me. The cache points are beautifully and symmetrically bevelled, with median ribs on both faces and a lozenge cross-section. Two variants of the same stemmed type were isolated finds in other areas of this large site. Plate IV: f has a shorter blade, also with median ridges, but the base of its long stem has slight lateral nubs. Plate V: f does not have median ridges, but rather a median facet on each face. That portion of the lateral blade edge which is still preserved is marked by delicate, shallow serrations, spaced 2 mm apart.

Ground stone adzes: Four specimens of the trianguloid variety, roughly similar to the chipped blanks found in FB-1. These specimens, also made of silicified slate, show signs of chipping along the sides, but their rounded backs have been ground smooth.

GOUGES: Five specimens, as in Plate V: o and Plate VI: a, all of ground and polished silicified slate. Two variants are evident: Plate V: o is plano-convex in section, while Plate VI: a, represented by three specimens, has a trianguloid section with a strong dorsal ridge.

FB-4 (Plate VI: f–j, l, m). 59 specimens: 16 points, 13 knives, 4 scrapers, 2 prismatic blades, 2 chopping tools, 22 indeterminate fragments. Forty-one of quartzite, 17 of chert, 1 silicified slate.

POINTS: *Leaf-shaped:* One specimen of chert, bifacially worked, with retouched edges, convex sides, and rounded base.

Stemmed: One specimen of quartzite, crudely flaked on both faces. The narrow, straight-sided stem has lightly ground edges.

Side-notched: Thirteen specimens, as in Plate VI: f–h. Skilfully made blades, pressure-flaked on both faces, with edge retouching. The notches are deep and wide and lightly ground. Eight of translucent grey quartzite and five of chert. All specimens incomplete, but they appear to be large spear points.

Indeterminate: Two specimens of chert, a tip fragment and a midblade section.

KNIVES: *Ovoid:* One specimen of silicified slate, crudely worked on both faces.

Asymmetric: Eight specimens, as in Plate VI: i, j. All examples bifacially worked with occasional bits of edge retouching. There is a wide range of size in this type, but the asymmetric shape with one relatively straight and one convex edge is the unifying characteristic. Five of quartzite, three chert.

Indeterminate: Four specimens of knife fragments. Two quartzite and two chert.

SCRAPERS: *End scrapers:* Four specimens, as in Plate VI: l, m, all quartzite. All plano-convex in cross-section, with shaping retouch and nose flaking only on the convex dorsal face. Two have straight, parallel sides, and two have tapered stems.

PRISMATIC BLADES: Two specimens, one chert and one quartzite. There were no other signs of blade-making technique in the site, with the exception of several of the side-notched points which have a plano-convex cross-section and were apparently fashioned from large blades.

CHOPPING TOOLS: Two specimens of quartzite exhibit roughly flaked knife-like or chopping edges.

INDETERMINATE FRAGMENTS: Twenty-two portions of knives, scrapers, etc. Seventeen quartzite, five chert.

FB-5: This small Dorset Eskimo site will be discussed in a later report.

Loup-1 (Plate VII: a–c). Four specimens: two point fragments, one knife, one core. Three of chert, one of quartzite.

Plate V

Artifacts

FB-3

a, b.	Stemmed points (p. 215)
c.	Lanceolate point or knife (p. 214)
d.	Asymmetric knife (p. 215)
e.	Leaf-shaped knife (p. 215)
f.	Stemmed and faceted slate knife (p. 218)
g, h.	End scrapers (p. 215)
i.	Flake scraper (p. 215)
j.	Flake knife (p. 215)
k.	End scraper (p. 215)
l, m.	Drills (p. 218)
n.	Prismatic blades (p. 218)
o.	Plano-convex gouge (p. 219)

PLATE V

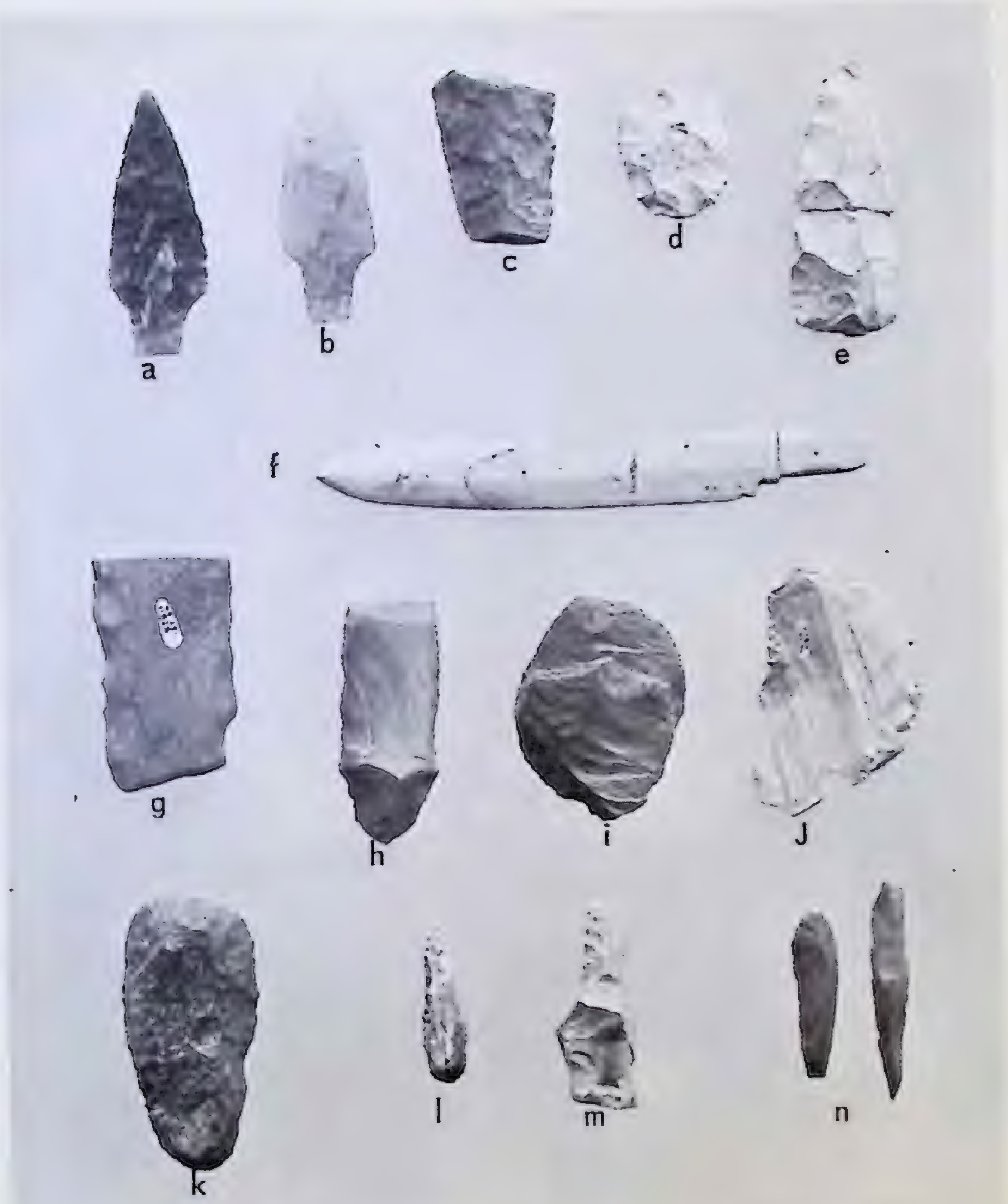
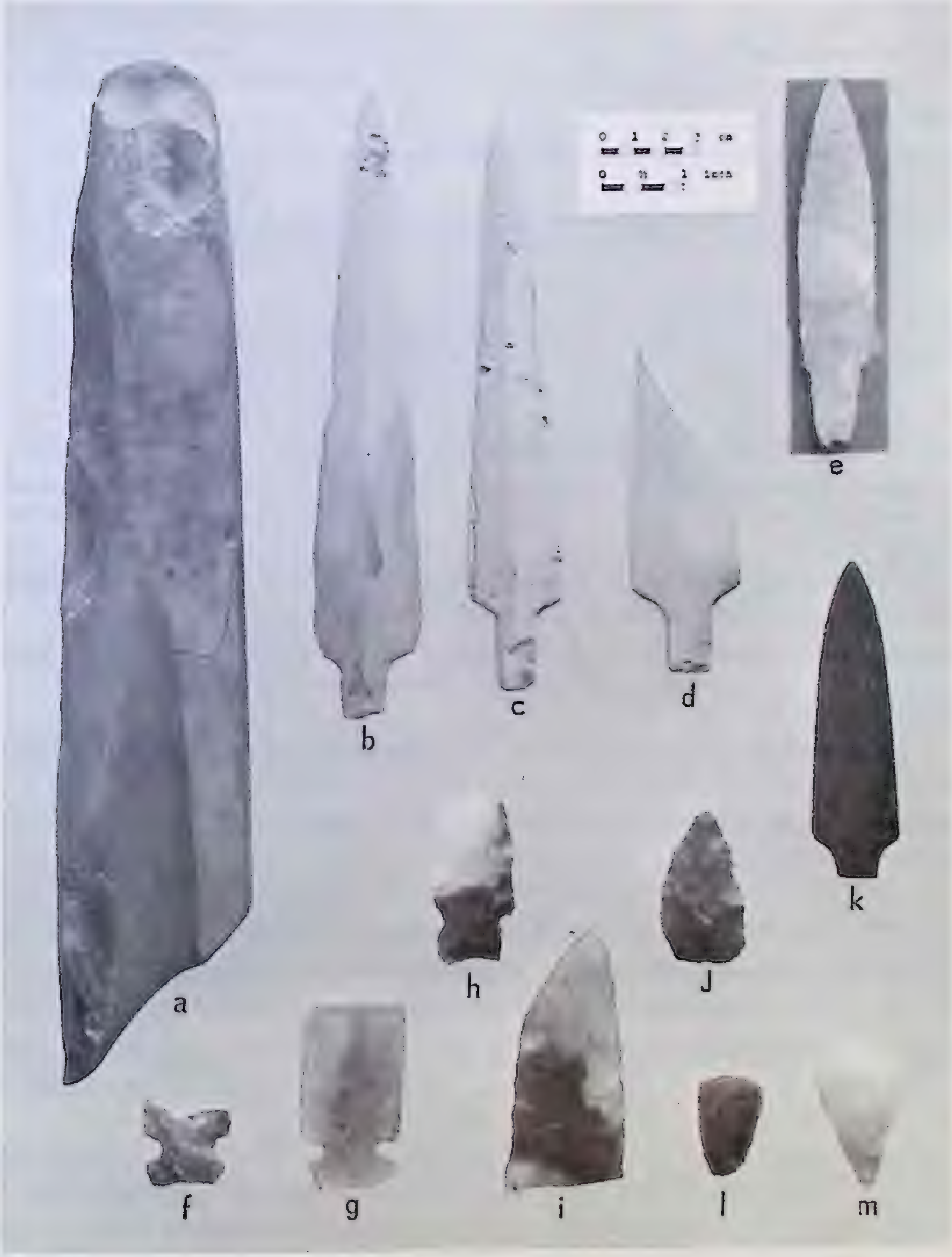


Plate VI

Artifacts

a.	Trianguloid gouge (p. 219)	FB-3
b–d.	Stemmed slate points (p. 218)	"
e.	Stemmed point (p. 215)	"
f–h.	Side-notched points (p. 219)	FB-4
i, j.	Asymmetric knives (p. 219)	"
k.	Stemmed slate point (p. 218)	FB-3
l, m.	End scrapers (p. 219)	FB-4

PLATE VI



Points: *Probably lanceolate:* One specimen, Plate VII: b. Bifacially worked in chert, heavily patinated.

Indeterminate type: One specimen, Plate VII: c. Neat bifacial pressure flaking.

Knife: *Asymmetric:* One specimen, Plate VII: a. Translucent grey quartzite; bifacial flaking with fine edge retouching. Essentially plano-convex in cross-section with slight longitudinal curvature deriving from original blade form.

Core: *Tabular:* One specimen of banded chert.

Loup-2 (Plate VII: d–h). 34 specimens: 17 points, 4 knives, 2 scrapers, 2 blanks, 3 cores, 2 hammerstones, 4 worked fragments. Thirty of pink quartzite, 4 of crystalline quartz.

Points: *Leaf-shaped:* Four specimens, as in Plate VII: g. All bifacially flaked with edge retouching and basal thinning; longitudinal curvature.

Lanceolate: One specimen with basal thinning and bifacial flaking.

Stemmed: Four specimens, as in Plate VII: d, e. Bifacial flaking with edge retouch. Plate VII: d has plano-convex cross-section and long basal flute on convex face. Two specimens of this type, as in Plate VII: e, might be classified as corner-removed; they are close in appearance to the following type.

Corner-notched: Four specimens, as in Plate VII: f. Bifacial flaking with edge retouching; some of the notches seem to be lightly ground.

Knives: *Leaf-shaped:* Four specimens, as in Plate VII: h. All bifacially worked with percussion technique and plano-convex in cross-section. May be incomplete blanks.

Large biface: Four specimens, all fragments of indeterminate size, but larger than leaf-shaped type.

Scrapers: *End scraper:* One plano-convex fragment with steep retouching around nose.

Amorphous: One specimen, a chip spall with partial edge retouching.

Blanks: Two large, plano-convex specimens, crudely percussion flaked.

Hammerstones: Two specimens, both fragments of quartzite pebbles.

Cores: Three specimens, all quartzite pebbles.

Diable-1 (Plate VII: i–s). 32 specimens: 10 points, 7 knives, 2 scrapers, 2 drills, 2 adzes, 1 hammerstone, 2 blanks, 6 fragments. Fourteen of quartzite, 13 of chert, 4 slate, 1 glass.

Points: *Stemmed:* Seven specimens, as in Plate VII: i–k, m. The blades are strongly triangular in this type, and all specimens are bifacially flaked. As in Loup-2, at least two examples trend toward the barbed form.

Lanceolate with tapered stem: One specimen, Plate VII: l. This is bifacially and very delicately pressure flaked, although plano-convex in section. Fine retouching of the edges and incipient serrations.

KNIVES: *Asymmetric:* One specimen, Plate VII: n, seems to have been a side blade. It is bifacially worked, plano-convex in section, and has retouched edges.

Leaf-shaped: Four specimens, as in Plate VII: p–r. One has been basally thinned on one face, suggesting use as an end blade.

Amorphous: Two flake specimens that have been bifacially retouched for apparent use as knives.

SCRAPERS: *Amorphous:* Two specimens, one a retouched flake of chert, and the other a fragment of green bottle glass, 9 mm thick, trimmed along one edge, Plate VII: s.

DRILLS: Two specimens, as in Plate VII: o. Both are chert and have a lozenge-shaped cross-section.

ADZES: Two specimens. One is a tabular block of chert with steep retouch around its convex nose, 2.1 cm thick, while the other is a spall fragment of ground and polished silicified slate. The latter equates with a specimen from Gold Cove, Newfoundland.

HAMMERSTONE: One specimen, a fragment of quartzite pebble.

BLANKS: Two quartzite artifacts appear to be incomplete asymmetric knives.

UNIDENTIFIABLE FRAGMENTS: Three specimens of chert and two of ground slate.

Diable-2 (Plate VII: t–w). 13 specimens: 5 points, 1 knife, 2 scrapers, 5 fragments. Seven of chert and 6 of quartzite.

POINTS: *Side-notched:* Two specimens, Plate VII: t, u. Both chert, biconvex section, retouched edges. The smaller point is basally thinned on one face and the notches seem to be lightly ground.

Leaf-shaped: Three specimens, as in Plate VII: v, w. Bifacial flaking with edge retouching. Bases of two are rounded and one is square. One, not illustrated, may have been side blade of a knife.

KNIFE: One fragmentary specimen of indeterminate type. Chert.

SCRAPERS: *Amorphous:* Two specimens, a flake of quartzite and one of chert, have unifacial edge retouching.

FRAGMENTS: Five specimens, of which four are probably tip fragments of points or large biface blades.

Modeste-1 (Plate VIII: a–f). 31 specimens: 13 points, 3 knives, 2 scrapers, 2 blanks, 11 fragments. Twenty of quartzite and 11 of crystal quartz.

POINTS: *Triangular:* Thirteen specimens, as in Plate VIII: a–d. All are made of quartzite or crystal quartz; bifacially flaked; sides vary from slightly concave to slightly convex; bases are straight to slightly concave, and a majority are thinned.

Plate VII

Artifacts

a.	Asymmetric knife (p. 224)	Loup-1
b.	Lanceolate point or knife (p. 224)	“
c.	Fragment of point or knife (p. 224)	“
d, e.	Stemmed points (p. 224)	Loup-2
f.	Corner-notched point (p. 224)	“
g.	Leaf-shaped point (p. 224)	“
h.	Leaf-shaped knife (p. 224)	“
i–k.	Stemmed points (p. 224)	Diable-1
l.	Stemmed lanceolate point (p. 224)	“
m.	Stemmed point (p. 224)	“
n.	Asymmetric knife (p. 225)	“
o.	Drill (p. 225)	“
p.	Leaf-shaped knife (p. 225)	“
q, r.	Fragments of large biface knives (p. 225)	“
s.	Green glass scraper (p. 225)	“
t, u.	Side-notched points (p. 225)	Diable-2
v, w.	Leaf-shaped points or knives (p. 225)	“

PLATE VII

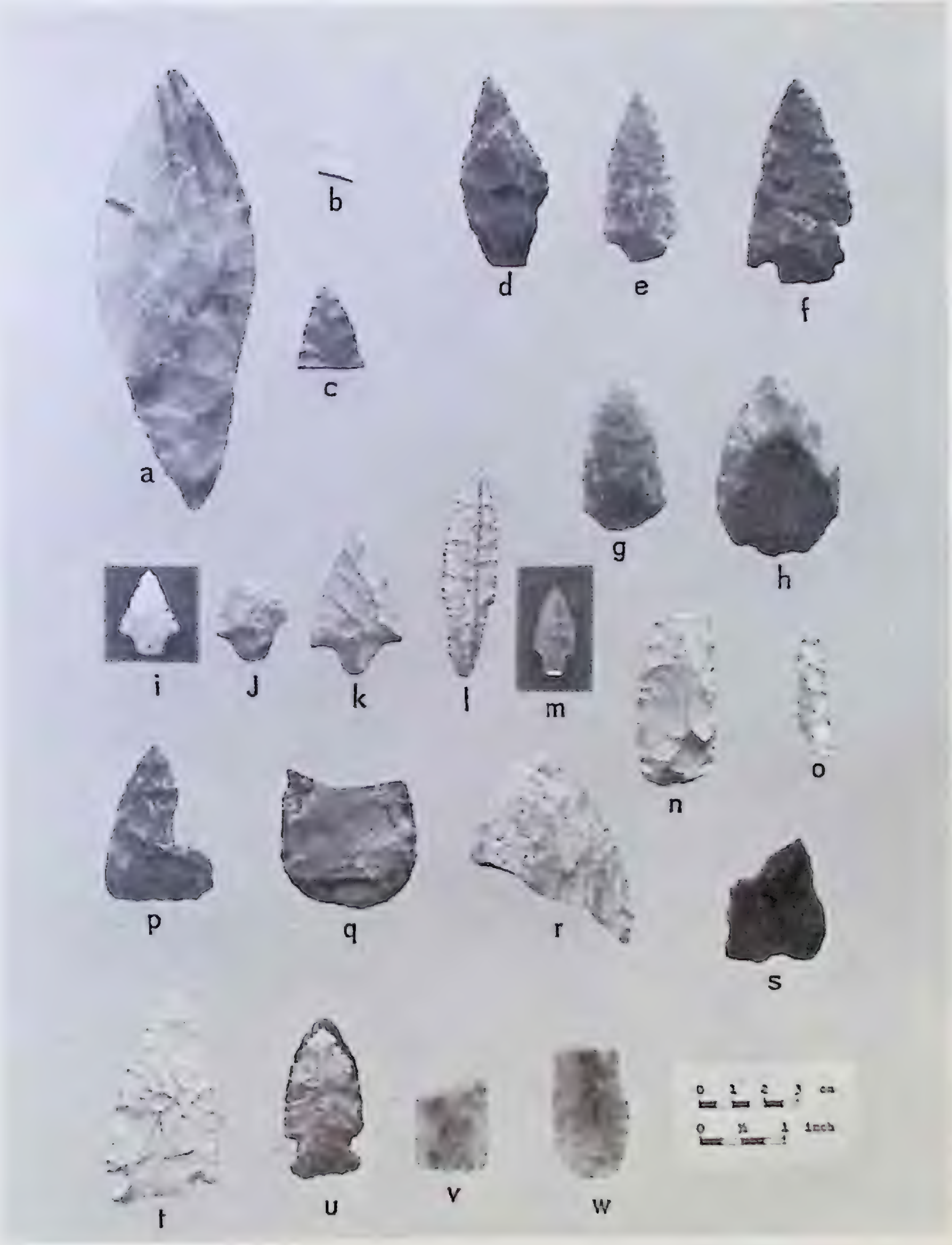
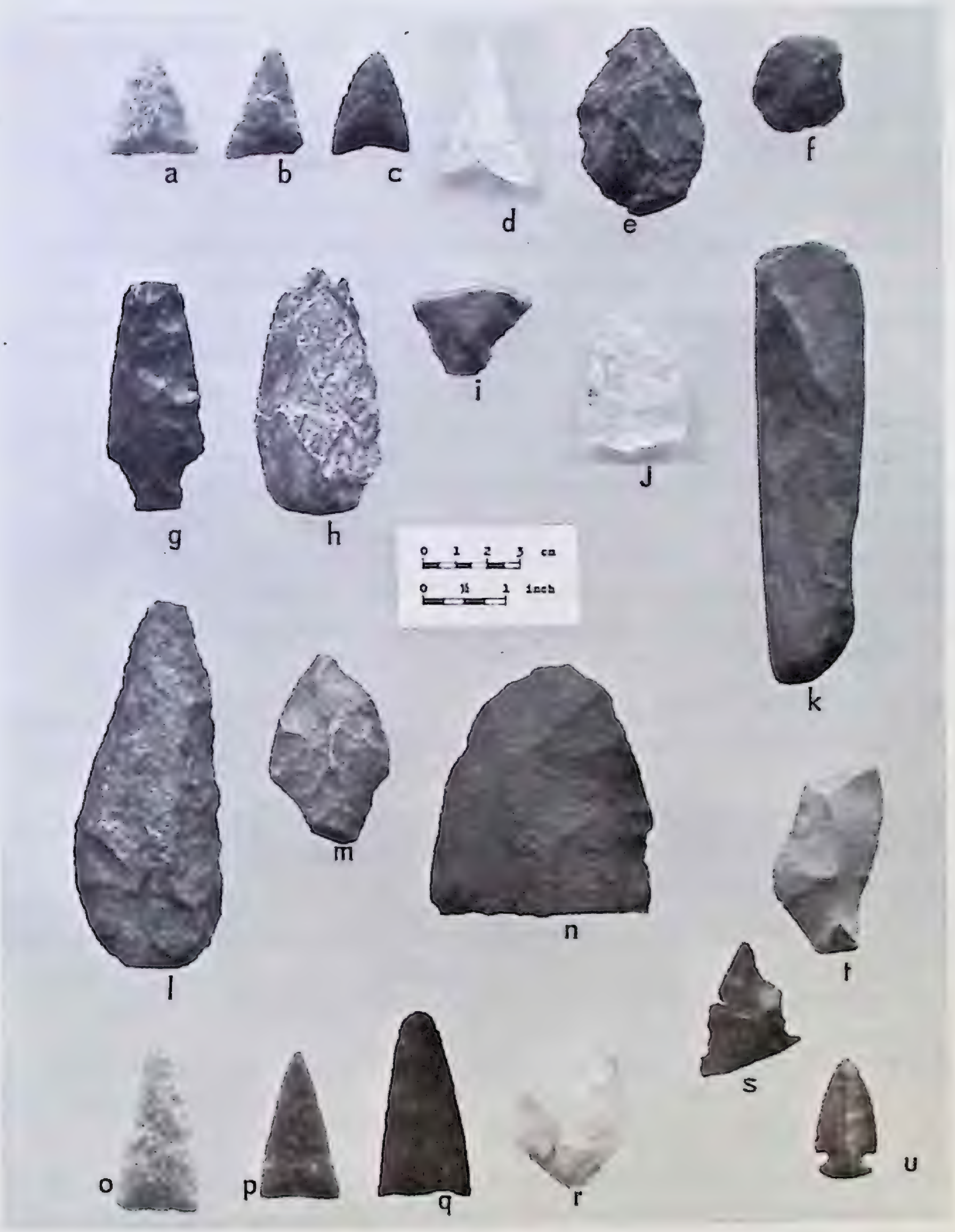


Plate VIII

Artifacts

a–d.	Triangular points (p. 225)	Modeste-1
e.	Leaf-shaped knife (p. 230)	“
f.	Ovoid knife (p. 230)	“
g.	Stemmed point (p. 230)	Modeste-2
h.	Asymmetric knife (p. 230)	“
i.	End scraper (p. 230)	“
j.	Asymmetric knife (p. 230)	Modeste-3
k.	Hone (p. 230)	“
l.	Asymmetric knife (p. 231)	Pinware W-2
m.	Stemmed point of tripoli (p. 230)	“
n.	Blank (p. 231)	“
o, p.	Triangular points (p. 231)	Pinware W-3
q.	Fragment of probable lanceolate knife (p. 231)	“
r.	Plano-convex scraper (p. 231)	“
s, t.	Amorphous flake scrapers (p. 231)	Pinware W-5
u.	Side-notched point (p. 231)	“

PLATE VIII



KNIVES: *Leaf-shaped:* One specimen, Plate VIII: e. A roughly chipped biface with remnant of a striking platform left at the bottom. Probably unfinished.

Ovoid: Two specimens, as in Plate VIII: f. Quartzite flakes that have been bifacially chipped around most of periphery.

SCRAPERS: *Amorphous:* Two specimens are exterior pebble spalls with partially retouched edges.

BLANKS: Two specimens, otherwise indeterminate.

FRAGMENTS: Eleven specimens, of which at least three are portions of points or knives.

Modeste-2 (Plate VIII: g–i). Nine specimens: three points, three knives, two scrapers, one fragment. Three of chert, six quartzite.

POINTS: *Stemmed:* Three specimens, as in Plate VIII: g. Lanceolate blade of unknown length, bifacial flaking with edge retouching, stem rather coarsely fashioned.

KNIVES: *Asymmetric:* Two specimens, as in Plate VIII: h. Plano-convex in section, but roughly flaked over most of both surfaces.

Amorphous: One specimen, a prepared quartzite spall.

SCRAPERS: *End scraper:* One specimen, Plate VIII: i. A chip spall with trimmed stem; the convex nose is a remnant of pebble surface which has been partly chipped.

Amorphous: One specimen, chipped as a side scraper.

FRAGMENTS: One specimen, a portion of a biface.

Modeste-3 (Plate VIII: j, k). Seven specimens: one knife, one scraper, one hone, four fragments. One of silicified slate, six quartzite or crystal quartz.

KNIFE: *Asymmetric:* One specimen, Plate VIII: j. Bifacially flaked with retouched edges. Base is also worked on both faces, but not thinned.

SCRAPER: *Turtle-backed:* One specimen, ovoid in shape.

HONE: One specimen, silicified slate, with one lateral edge rubbed. Plate VIII: k.

FRAGMENTS: Four specimens of worked quartzite. Unidentifiable.

Pinware W-1: The single specimen from this site was given to me. It is an amorphous scraper made on a flake of banded chert; the dorsal face is faceted, and one edge has been minutely retouched.

Pinware W-2 (Plate VIII: l–n). Four specimens: one point, one knife, two blanks. One of tripoli, one quartzite, one basalt, one metamorphic.

POINT: *Stemmed:* One specimen, Plate VIII: m. Fashioned by coarse bifacial flaking with partial retouching of the edges; maximum thickness

14 mm; seems unfinished. This artifact was presumably made of flint or chert, but when found it had become totally weathered to chalk-like tripoli. Eleven additional flakes of tripoli were also found in this site.

KNIFE: *Asymmetric:* One specimen, Plate VIII: l, of coarse-grained quartzite, rudely percussion flaked on both surfaces, with slight retouching of convex edge.

BLANKS: Two specimens, as in Plate VIII: n, one of basalt, one of metamorphosed sedimentary rock; both show crude bifacial flaking on one or more edges. May be unfinished blanks or rough chopping tools.

Pinware W-3 (Plate VIII: o–r). 18 specimens: 8 points, 2 knives, 4 scrapers, 3 utilized flakes, 1 residual core. One of basalt, 17 quartzite.

POINTS: *Triangular:* Eight specimens, as in Plate VIII: o, p. Generally well flaked bifacially, considering the coarseness of the quartzite material; predominantly isoscelene form with bases straight to slightly concave.

KNIVES: Two specimens of indeterminate type, as in Plate VIII: q. The one illustrated is a biface implement, finely chipped from a basaltic material, with retouched edges. The other is coarse-grained quartzite, bifacially worked and may be a fragment of either an ovoid knife or of a round-based longer blade.

SCRAPERS: Four specimens, as in Plate VIII: r. All are plano-convex chips of quartzite fashioned into side scrapers. May be described as keeled.

UTILIZED FLAKES: Three specimens of crystalline quartz, each with one retouched edge.

CORE: One specimen, which is either residual or possibly a blank.

Pinware W-4: No specimens from this site.

Pinware W-5 (Plate VIII: s–u). Nine specimens: one point, six scrapers, one prismatic blade, one adze. Eight of chert, one silicified slate.

POINTS: *Side-notched:* One specimen, Plate VIII: u. Beautifully made artifact of banded chert with fine bifacial pressure flaking.

SCRAPERS: *Amorphous:* Six specimens, as in Plate VIII: s, t, all made of random flakes of chert with one or more edges delicately retouched. One specimen illustrated has been retouched to a point and might have been serviceable as a drill. Three others, not shown, could be designated as side scrapers on blades.

PRISMATIC BLADE: One specimen of chert, 4.2 cm by 1.2 cm by 05 mm. No sign of retouching; bulbar end missing.

ADZE: One specimen of silicified slate, badly weathered and spalled; 14 cm long, pecked and ground to ovoid cross-section; indication of chipping on the poll; nose end ground off on both faces.

Pinware E-1: Two non-diagnostic specimens in quartzite. One is a fragment of a point, similar to those found at Diable-2, and the other is a chunky core.

Pinware E-2 (Plate IX: a–k). 26 specimens: 3 points, 6 knives, 3 scrapers, 3 adzes, 1 chopping tool, 2 ground slate blades, 8 fragments. Eighteen of quartzite, 3 hard greenstone, 3 slate, 1 chert, 1 basalt.

POINTS: *Stemmed:* Two specimens, Plate IX: a, b. Both made on thin blades of translucent grey quartzite and shaped entirely by retouching of the edges. The stem edges of (a) seem to have been ground.

Side-notched: One specimen, Plate IX: c. Made of slatey material and shaped by grinding; edges bevelled from both faces.

KNIVES: *Stemmed:* One specimen, Plate IX: d. A roughly flaked biface knife with medium retouching of edges. Length of stem unknown, but corner notches are ground. Translucent grey quartzite.

Five other fragments of the same material are tips of comparable blades: bifaces with fine edge retouching; basal ends are missing. As in Plate IX: g, h.

SCRAPERS: *Spall:* One specimen, Plate IX: e, of basalt. A plano-convex spall with rough step-flaking around portion of the convex end.

End scraper: One specimen, Plate IX: i, consisting of a fragment of quartzite, the upper end of which has been purposefully shaped and steeply retouched.

Amorphous: One specimen, apparently a random flake of translucent grey quartzite with fine retouching on one of its edges.

CHOPPING TOOL: One specimen, Plate IX: j, of translucent grey quartzite, maximum thickness 41 mm, overall bifacial percussion flaking and traces of somewhat finer edge retouching. Possibly a blank.

GROUND SLATE BLADES: Two fragmentary specimens, not clearly diagnostic. One is a thin spall from a blade of unknown size and shape, and the original edge bears a series of fine serrations spaced 01 mm apart. The other is a fragment of blade which has one ground face, while the other face shows light traces of chipping; its one whole edge is bevelled from both faces.

ADZES: Three specimens, as in Plate IX: f, k. Those illustrated are made of greenstone: (f) has an approximately rectangular cross-section and a maximum thickness of 29 mm; initially it was chipped, and the cutting edge was then ground from both faces; (k) is humpbacked and roughly triangular in section; its body and poll were apparently shaped by pecking, and the cutting edge, which is slightly convex, is formed by ground facets on top and bottom. The third specimen is fragmentary but looks much like (k) and is made of silicified slate.

FRAGMENTS: Eight specimens of translucent grey quartzite. Several are portions of indeterminate types, and the rest may be utilized flakes.

NEWFOUNDLAND

Ireland Bight (Plate X: a, b). Two specimens: two knives. One of chert and the other of hematite.

KNIVES: *Leaf-shaped, large:* One specimen, Plate X: a. Smooth bifacial flaking, biconvex cross-section, and edge retouching. Made of flint and heavily patinated.

Asymmetric: One specimen, Plate X: b. Skilled bifacial flaking, biconvex cross-section, and fine edge retouching. Reconstructs to about 15 cm long. Hematite.

Port au Choix-3 (Plate XI: h–j; Plate XII: a–c, f, g). 22 specimens: 9 biface tools, 4 points, 4 scrapers, 2 adzes, 2 gouges, 1 blade-scraper. Ten of translucent grey quartzite, 8 of chert, 2 of limestone, 1 greenstone, 1 red sandstone.

Most of the specimens that I have from this locality are either gifts or purchases from the local inhabitants. The area covered by the site is large, and the various finds have been made over a number of years in widely separated locations and on two different terrace levels. Perhaps the most spectacular discovery was made by Mr. Walter Billard who, in 1946, dug a large cache of stone tools out of his garden on the 17-foot terrace. In all there were 64 implements and large flakes of translucent grey quartzite in this cache, as well as nine tabular cores of flint or chert. The latter had been chipped but showed no other signs of use. The original cache was found *in situ*, in a circular heap some 18 inches in diameter, buried at the base of a 6-inch layer of garden loam, and directly beneath it was coarse, water-laid sand and gravel. I substantiated this profile in a test trench across the back of the garden. Mr. Billard sold me a representative sample consisting of eight of the cache tools, and his brother, Mr. Pius Billard, later gave me a ninth. The following description covers the entire find, exclusive of the chert cores.

KNIVES: *Leaf-shaped:* Seventeen whole specimens, as in Plate XII: a, b, and four basal or tip fragments. The largest of these is 9½ inches long by 4 inches maximum width, and there is a total of eleven of comparable size. Six others are somewhat smaller. All are completely percussion-flaked over both surfaces and have a biconvex cross-section. The edges are totally retouched on both faces. Shapes vary from straight-sided and square-based to moderately convex sides and bases.

Semi-lunar: Six specimens, as in Plate XII: c, g. Aside from their different shape, these implements exhibit the same characteristics as the large knives.

SCRAPERS: Eight specimens, all side scrapers, as in Plate XII: f. These are made of flakes of various shapes which range from 2 to 5 inches in length. Usually one or more edges have percussion retouching or haphazard flaking caused by some use of the tool.

Plate IX

Artifacts

Pinware E-2

a, b.	Stemmed points (p. 232)
c.	Side-notched point (p. 232)
d.	Stemmed knife (p. 232)
e.	Spall scraper (p. 232)
f.	Rectanguloid adze (p. 232)
g, h.	Fragments of biface knives (p. 232)
i.	End scraper (p. 232)
j.	Chopping tool or blank (p. 232)
k.	Humpbacked adze (p. 232)

PLATE IX

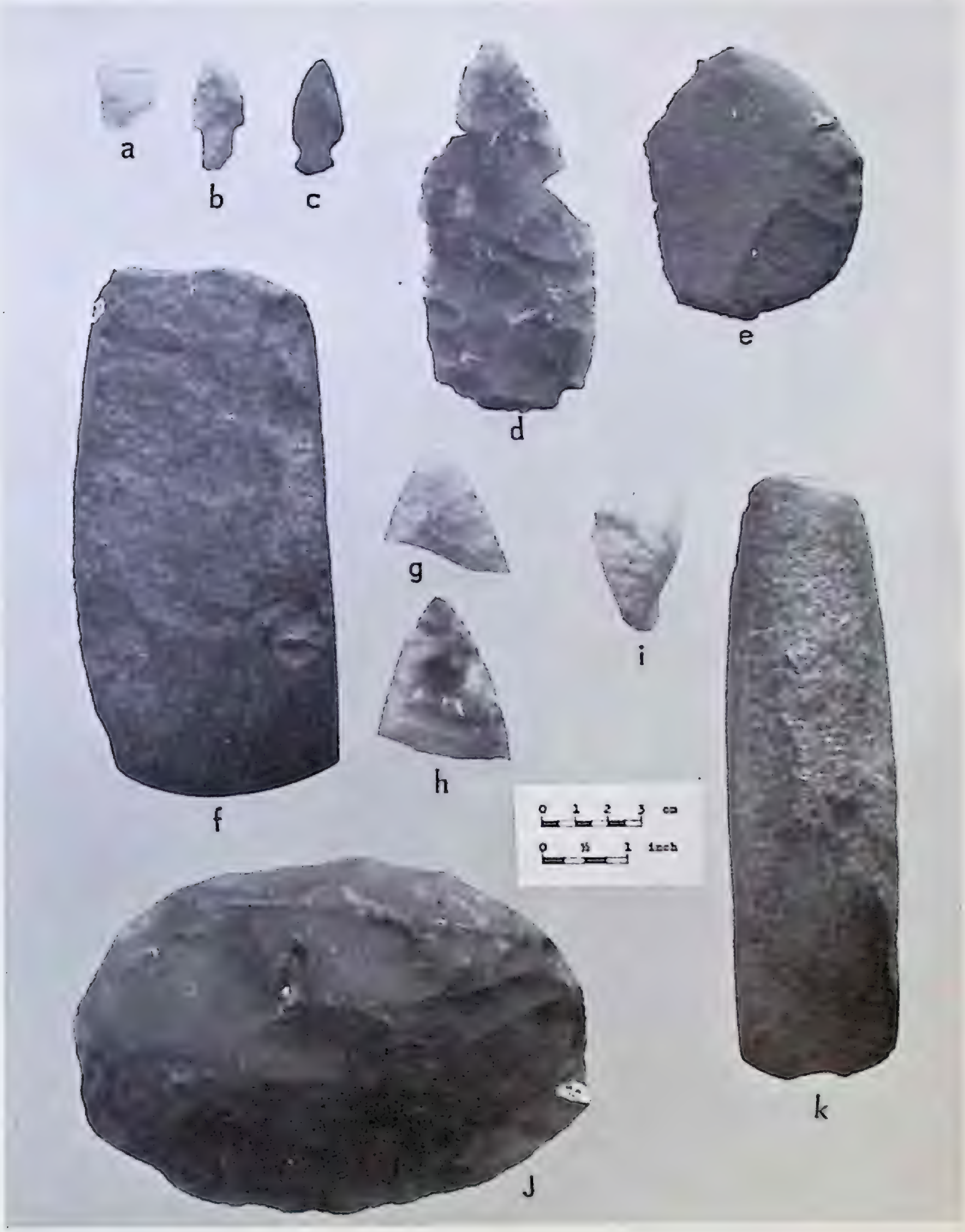
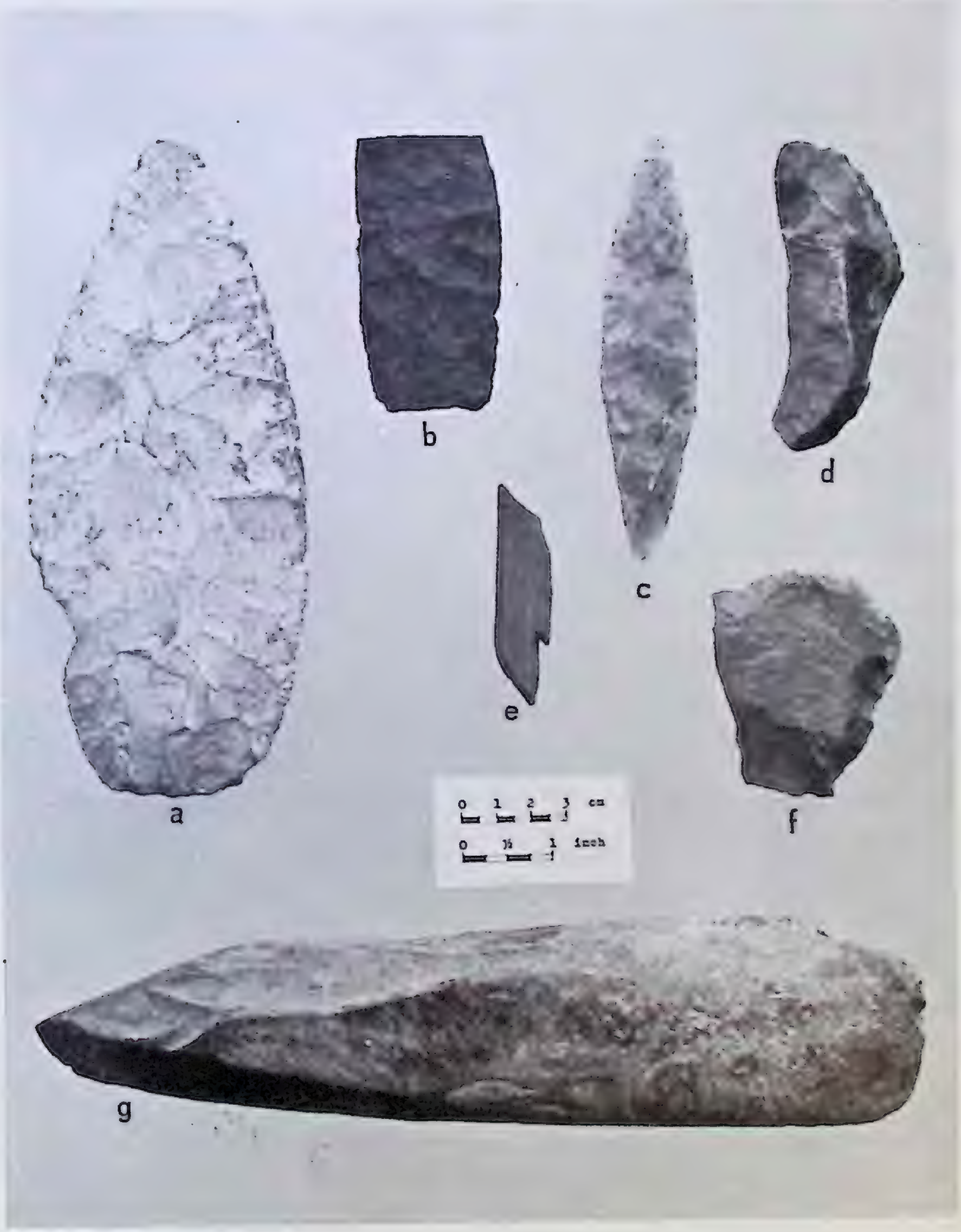


PLATE X

Artifacts

a.	Leaf-shaped knife (p. 233)	Ireland Bight
b.	Asymmetric knife (p. 233)	"
c.	Stemmed lanceolate point (p. 239)	Gold Cove-1
d.	Amorphous flake knife (p. 239)	"
e.	Fragment of bevel-ground blade (p. 244)	"
f.	Amorphous flake scraper (p. 244)	"
g.	Plano-convex adze (p. 244)	Gold Cove-2

PLATE X



Miscellaneous flakes and blades: Twenty-nine specimens of various shapes, from 2 to 4 inches long, but showing no sign of use.

Fragments: Four specimens, basal or tip fragments of knives.

Other stone artifacts which I obtained from Walter Billard's garden came from the test trench, as follows:

Points: *Leaf-shaped:* One specimen of chert, not shown. Symmetrical blade, rather coarsely and bifacially flaked. The base is straight and purposefully thinned, as if for hafting. This tool might have been a knife.

Stemmed: Two specimens, not shown, one of chert and the other of translucent grey quartzite. In each case the stem is missing, but there are visible signs of tapering where the bases are sheared off.

Side-notched: One specimen, not shown. This is a plano-convex point, delicately made, of a type normally associated with Dorset Eskimo sites that I have excavated elsewhere on Cape Riche. It is clearly anomalous in the context of Port au Choix-3, at least as far as I know it, and I have no adequate explanation for its occurrence there. It might be evidence of onetime Dorset occupation in this site, although that possibility is not supported by any other data. It might as well be a random lost artifact.

Scrapers: *Amorphous:* Four specimens, not shown. All are made on apparently random flakes of chert and have been retouched as end or side scrapers.

In 1961 Mr. Walter Billard gave me another specimen which he had found in 1959 while turning over a new garden plot on the 17-foot terrace. This is a beautifully-made bayonet point of red slate, Plate XI: h. The blade has the cross-section of a flattened lozenge and has been skilfully ground and polished into perfect symmetry. The broken tip appears to have tapered off to some degree of point, while the other convex end has been bevelled to a fairly sharp edge, on one face only. Both faces have strong longitudinal keels. The specimen falls in between the simple and faceted-tip variants of the so-called Ontario bayonet (Wright, 1962, Fig. 4).

Other stone artifacts from the general area of Port au Choix-3 are four adzes and gouges given to me by Messrs. Ernest and Pius Billard. These specimens came from the 29-foot terrace and are the only artifacts known from that level. Some fifty feet of exploratory trenching there has so far failed to produce any other evidence.

Gouges: Two specimens, as in Plate XI: i. The one illustrated is made of hard greenstone and has a triangular cross-section, with the dorsal face strongly keeled near the poll. The clear and well-formed groove tapers gradually toward the poll. The second specimen, not shown because it is so badly eroded, is made of limestone and is plano-convex in cross-section. The narrow groove is parallel-sided, extends for about one-third of the overall length, and is so shallow as to be almost imperceptible.

Adzes: Two specimens, made of limestone, not illustrated because of their extremely eroded condition. One is roughly oval in cross-section and is flattened somewhat toward the bit; the poll is missing. The other is plano-convex and has a shallow groove in its dorsal surface near the poll end, which is broken off.

Other evidence that I have from Port au Choix-3 will be analysed in a future paper, after I have had an opportunity to carry out further investigations there. This now consists of three burials and associated grave furnishings that have been dug up by the local inhabitants at various times during the last twenty-odd years. The grave goods are unquestionably Boreal Archaic in character, but I wish to analyse them in comparison with a Dorset Eskimo burial, also found in the near vicinity.

Port au Choix-9 (Plate XII: d, e). Two specimens: one knife, one adze. Both made of shaly limestone.

KNIFE: *Leaf-shaped:* One specimen, Plate XII: e. Biconvex section with coarse flaking on both faces and partial edge retouching.

ADZE: *Trianguloid:* One specimen, Plate XII: d. Coarse bifacial flaking with edge retouching on the long, slightly tapering sides. The convex nose has been thinned to an adze-like edge from the flat ventral face.

Portland Creek (Not illustrated). Four specimens: three knives, one chopping tool.

KNIVES: *Leaf-shaped:* Two fragmentary specimens of translucent grey quartzite. Made on thin blades with shallow bifacial flaking and similar to a number of specimens found in the Labrador sites.

Flake: One specimen, an asymmetric flake of black igneous rock with coarse percussion flaking and partial edge retouch.

CHOPPING TOOL: One specimen, a crude spall of quartzite with one edge bifacially flaked.

Woody Point, Bonne Bay (Plate XI: j). One specimen, a large stemmed point made of reddish, fine-grained quartzite. It is evenly flaked over both faces and has a biconvex cross-section and fine edge retouching. The tapering stem has not been ground.

Deer Lake (Plate XI: g). One specimen, a stemmed point of flint which is bifacially worked, is biconvex in cross-section and has retouched edges. The shoulders are square, as in the Woody Point specimen, but there is a slight suggestion of basal tangs on the stem.

Gold Cove-1 (Plate X: c–f). Eight specimens: three points, one knife, three scrapers, one indeterminate. Four of quartzite, three of flint, and one of silicified slate.

POINTS: *Lanceolate:* Three specimens, as in Plate X: c. Full bifacial flaking, biconvex cross-section, and edge retouching. The tapered stem, beginning where slight shoulders are apparent, is lightly ground on both edges. One of translucent grey quartzite, and two of chert.

KNIVES: *Amorphous:* One specimen, Plate X: d. A tabular piece of chert with the upper convex edge prepared on both faces.

PLATE XI

Artifacts

a.	Gouge (p. 244)	Brown's Cove
b.	Fragment of lanceolate point (p. 244)	"
c.	Leaf-shaped point (p. 244)	"
d, e.	Asymmetric knives (p. 244)	"
f.	Ovoid knife (p. 244)	"
g.	Stemmed point (p. 239)	Deer Lake
h.	Bayonet point (p. 238)	Port au Choix-3
i.	Trianguloid gouge (p. 238)	"
j.	Stemmed point (p. 239)	Woody Point

PLATE XI

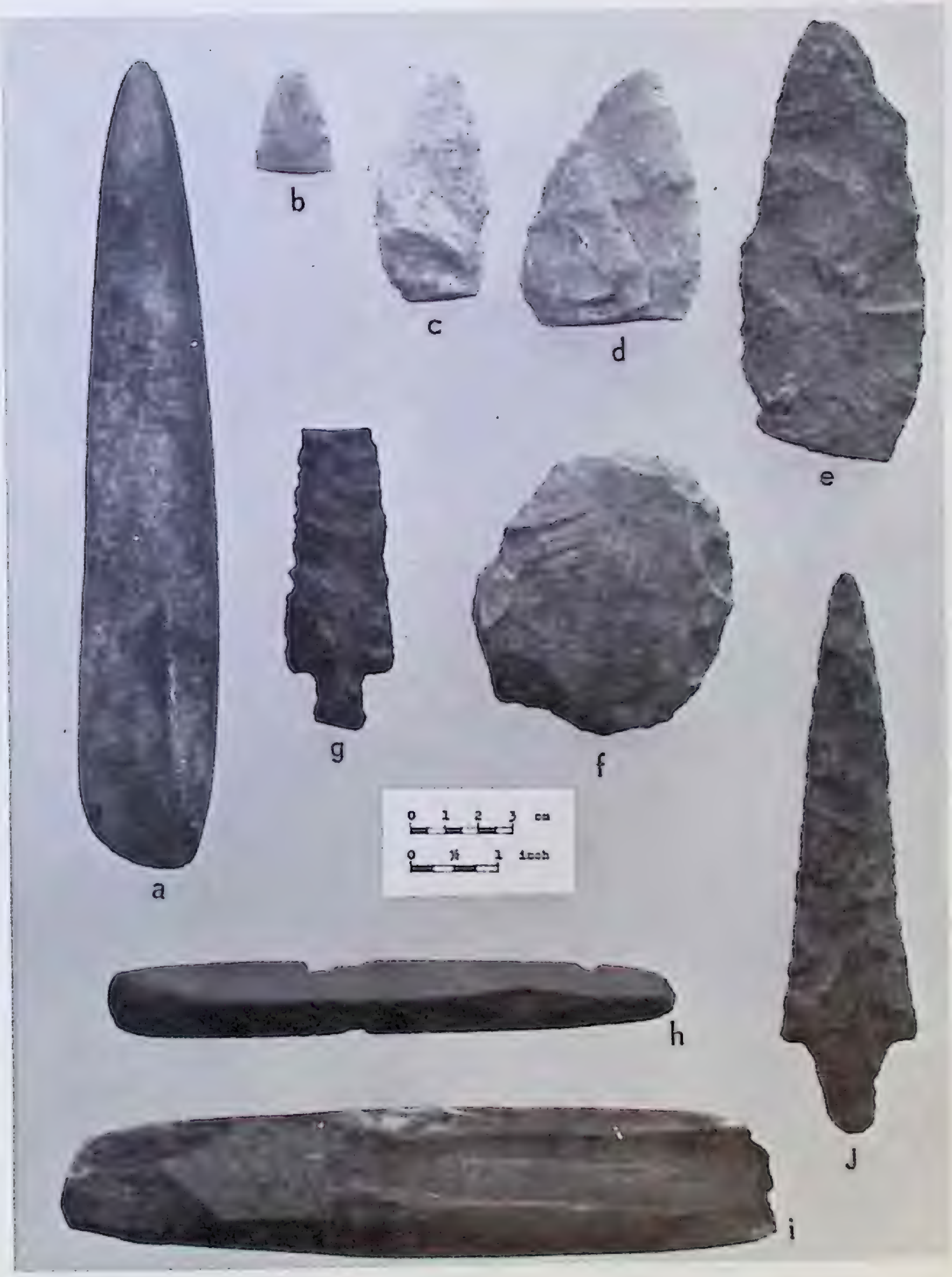
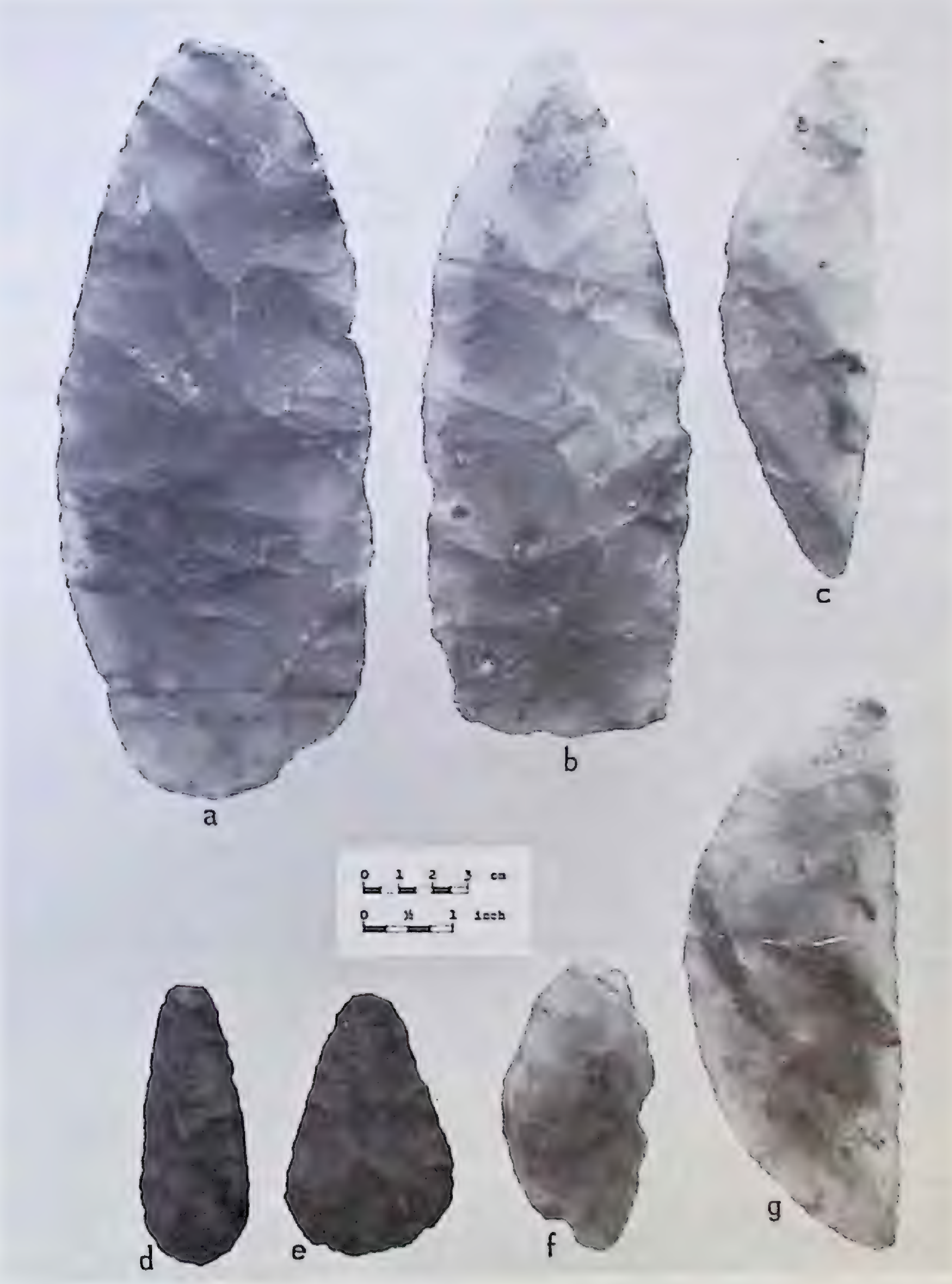


PLATE XII

Artifacts

a, b.	Leaf-shaped knives (p. 233)	Port au Choix-3
c.	Semi-lunar knife (p. 233)	"
d.	Trianguloid chipped adze (p. 239)	Port au Choix-9
e.	Leaf-shaped knife (p. 239)	"
f.	Amorphous flake scraper (p. 233)	Port au Choix-3
g.	Semi-lunar knife (p. 233)	"

Plate XII



SCRAPERS: *Amorphous:* Three specimens, as in Plate X: f, are all apparently random flakes of quartzite that have been retouched along portions of their edges.

INDETERMINATE: One specimen, Plate X: e, is possibly part of a ground stone blade or point. The fragmentary upper face is smooth, and the bevelled edge to the left bears a series of parallel striations which are clearly man-made.

Gold Cove-2 (Plate X: g). One specimen, an adze, is a block of silicified slate with strongly plano-convex cross-section and a convex nose that has been ground sharp on the dorsal surface. It equates closely with the adze blanks found at FB-1.

In addition to this, one large quartzite blank, with coarse bifacial percussion flaking, was found in this site.

Brown's Cove (Plate XI: a–e). Seven specimens: three points, three knives, one gouge. All of quartzite, except the limestone gouge.

POINTS: *Lanceolate:* One specimen, a stem fragment, Plate XI: b, seems to be the same as the type described above in Gold Cove-1. The edges are lightly ground.

Leaf-shaped: One specimen, Plate XI: c, is roughly flaked on both faces, with partial edge retouching. It may be incomplete and could have been a knife.

Indeterminate: One fragment.

KNIVES: *Ovoid:* One specimen, Plate XI: f, is a large flake that has been crudely retouched on both faces.

Asymmetric: Two specimens, Plate XI: d, e, fragmentary biface blades with partial edge retouching.

GOUGE: One specimen, Plate XI: a, is a long, slender tool, made with careful symmetry and tapering gracefully to a pointed poll. The concavity of the bit tapers out to the surface within one-third of the overall length. The bottom surface containing the groove is flat from bit to poll, whereas the back is fully rounded.

INTERPRETATION

SITE CLASSIFICATION

Of the various sites previously discussed, thirty-two are identifiable as non-Dorset Eskimo, or Indian. Twenty-three of these sites in southern Labrador yielded 773 specimens, and nine in northwestern Newfoundland produced a total of 49 specimens. The locales can be classed as major occupation areas, workshop sites, and camp-sites.

The major occupation sites in Labrador include BS-1 through 4; FB-1, 3, 4; Loup-1; Diable-1 and 2; and Pinware W-1, 4, and 5. All are located close to stream mouths, on more or less level terraces where broad areas up to three or four acres in extent seem to have been suitable for human habitation. Their orientation to the sea, as well as fresh water, is a common attribute, but their general exposure, in terms of prevailing wind direction, is quite variable. Sand dunes now thickly blanket all these sites, and deep systems of blowouts expose a complexity of formerly stabilized land surfaces. It is probable that at the time of aboriginal occupation they were partially, if not entirely, forested. Although no positive evidence of dwellings could be seen, the diversified artifact inventories suggest that there were significantly large occupations in these sites, if not by numerous people at one time, then at least by a few recurrently over a lengthy period. The favourable aspects of their geographical location also support this view.

In Newfoundland, six sites can tentatively be assigned to this same category, although in each case the evidence is even less complete than for the Labrador sites. These include Port au Choix-3, Portland Creek, Ireland Bight, Gold Cove-1 and 2, and Brown's Cove, several of which are occupied by present-day settlements.

The workshop sites, only four in number, are Loup-2, West St. Modeste-1 and 3, and Pinware West-3. They are situated on high elevations, and from that fact it may be inferred that they served as lookout positions. However, it is obvious from the vast quantities of cultural debris, consisting of cores, chips, and rejects, together with a limited inventory of finished tools, that they were important manufacturing centres. No other sign of occupation was observed. Several varieties of quartz and quartzite were the major minerals used in these centres, but brief searches around the sites did not uncover any significantly large sources of such raw materials.

The third category, camp-sites, includes BS-5 and 6, Modeste-2, Pinware W-2, Pinware E-1 and 2, and PC-9. From all indications these locales were occupied briefly, for the cultural traces were either scanty or confined to a small area, and the geographical character of all but the Pinware site does not suggest that they were adequate as extended dwelling places. Despite this reservation, however, the heavy stone tent ring in the blowouts at Pinware E-2 was the only positive evidence of a dwelling found in any of the sites. Port au Choix-9, on the other hand, with its limited representation of two artifacts and complete absence of other cultural material, seems to have been a simple lookout site that may have been used on one occasion only. As for the sites at Woody Point and Deer Lake, one can safely assume from Wintemberg's report (1939, p. 89) that the former was a true occupation site of major proportions, but the latter is insufficiently known for classification.

SITE ELEVATION

The vertical distribution of these sites through a considerable magnitude of elevation above sea-level is a noteworthy phenomenon, but not one that lends itself to immediate, facile interpretation. Northwestern Newfoundland and the adjacent coast of Labrador have been subject to crustal upwarping throughout post-Glacial time, and there is some evidence that the movement may be continuing today (cf. Flint, 1940, p. 1776; Tanner, 1947, p. 223–53; Harp, 1951, p. 219). This has led to the development and exposure of various marine features in the littoral zones, including wave-cut cliffs and benches, emerged strata of marine sediments, and several constructional forms, such as beach ridges, bars, and deltas. Clearly, then, any possible correlation between these cultural and physiographic sets of events could have an important bearing on studies in both the local archaeology and geology.

First of all, the vertical distribution, as shown in Figure 6, exhibits two general tendencies. The major occupation sites generally cluster at the lower levels between 20 and 40 feet, although several are found above and below this range. I have already described these locations, and the fact that they appear to have offered the most hospitable terrain for extensive human occupation is reason enough for their use. I judge that these sites were not situated on active beach fronts and were not any closer to the sea in prehistoric times than they are now, for the deep blowouts at Pinware E-2 and FB-3 have exposed series of ice-shove ridges that lie beneath the lowermost evidence of culture.

The second cluster consists of workshop sites at elevations of about 100 feet. Inasmuch as I did not observe any unusual sources of raw materials at these levels, I inferred that the locations may have been selected as lookouts. Otherwise, the random spread of small camp-sites at all levels is not significant. Several of this category do in fact seem closely related to actual raised beaches, but the evidence for this is derived from soil profiles and will be reviewed in the next section.

Unfortunately, the geological evidence concerning uplifted shoreline features in southern Labrador is not at all helpful. With specific reference to the coast between Blanc Sablon and Pinware Bay, Tanner (1947, p. 242) could not find any significant correspondence among the several series of cliff terraces that he measured, and he concluded that these features were in reality differential erosion platforms caused by the unequal resistance of the various horizontal Cambrian strata there. Furthermore, he could not satisfactorily distinguish between marine and lateral stream deposits, and hence could not determine the true levels of marine submergence.

Flint (op. cit.) has described the discontinuous upwarping of western Newfoundland where he observed only two conspicuous planes of wave-cut benches. The most recent of these lies at the present sea-level, and the earlier, named the Bay of Islands surface, extends from a measured elevation of 125 feet at the north end of Bonne Bay to an extrapolated height of 250 feet near the Strait of Belle Isle. He suggested that each of these planes required on the order of 5,000 years of wave-cutting activity, and, further, that the present-day benching at sea-level may post-date the Thermal Maximum. No date is offered for the development of the higher and earlier plane, but obviously, from this interpretation, the pause in the crustal uplift responsible for that bench must have occurred some thousands of years

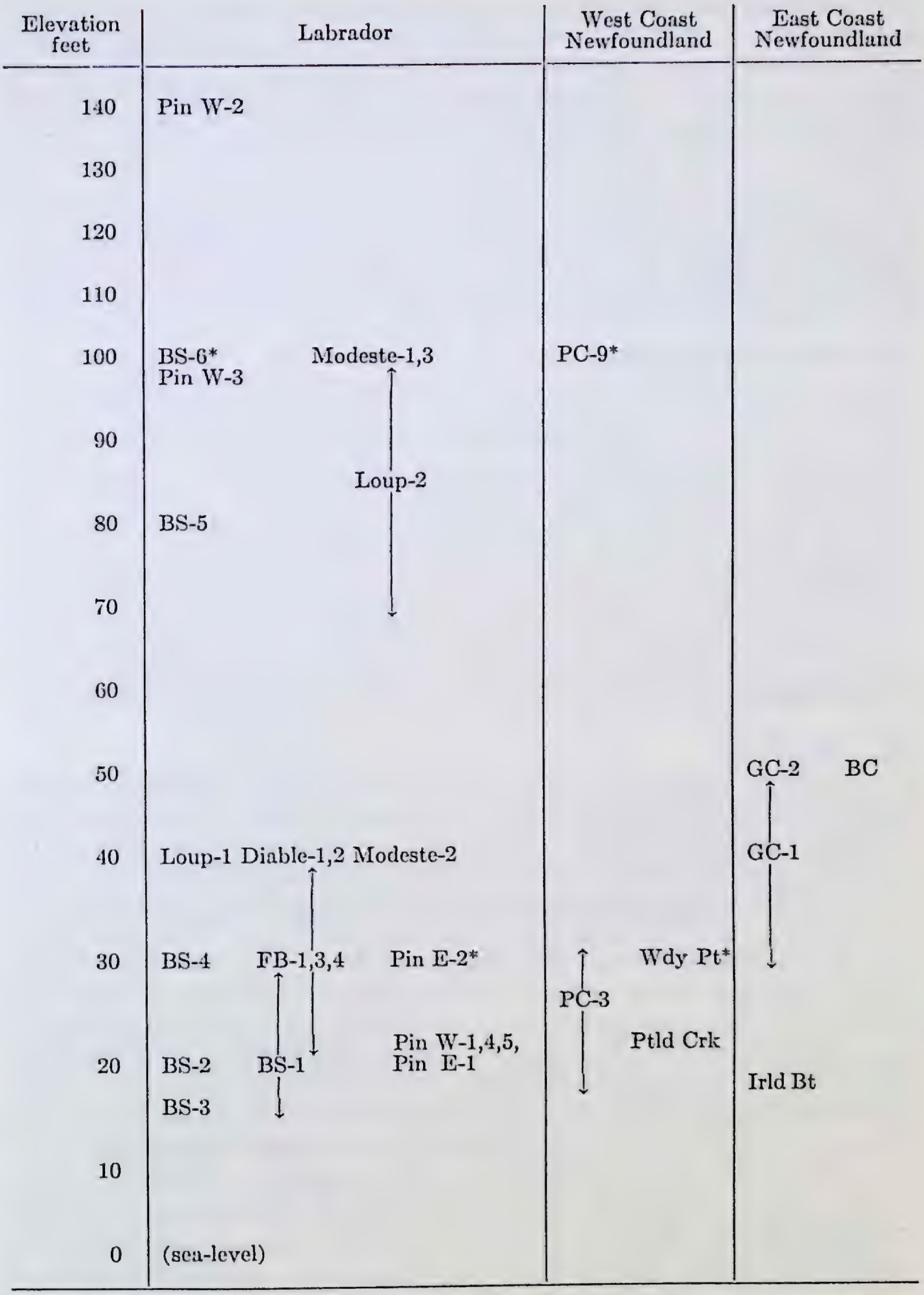


FIGURE 6. Comparative elevations of coastal sites (Elevations in feet above sea-level) (*Estimated elevations. All others measured.)

before the Thermal Maximum. Regardless of its age, however, no archaeological remains are known to be associated with the ancient Bay of Islands uplifted shoreline. As for intermediate elevations between contemporary sea-level and the Bay of Islands plane, Flint notes the existence of sporadic and discontinuous constructional features of minor size and infers that upwarping must have been fairly continuous except during the two major pauses.

On the basis of such limited information, it is impossible to make exact correlations of raised beaches on both sides of the Strait of Belle Isle. However, in 1949 in the area of Flowers Cove, at the narrowest portion of the Strait, I traversed inland from sea-level and found that certain benches there correspond very closely with others on the near-Labrador side. Specifically, these benches stand 20, 40, and 64 feet above the sea, and their fronts are outcrops of shelving limestone. I am not sufficiently competent to identify these as wave-cut benches, but I did observe that the rock at these levels exhibits the same fissuring, pot holes, and other signs of erosion that characterize the lowermost, present-day beach. Toward the south these benches gradually become lower and lose their coincidence with levels on the Labrador. In the geological context suggested by Flint, such levels, if they were indeed one-time active beachlines, must antedate the beginning of the second major pause in crustal upwarping that led to the establishment of the present coastline. In that case they are far too old, in all probability, to have ever been occupied by man while they were active beaches. Hence, the known post-Glacial sequence of physiographic changes in the coastlines of this region does not aid archaeological interpretation.

SOIL PROFILES

Although at first there seems to be a bewildering diversity of profiles in the sites (cf. the sample types in Figures 7 and 8), there are several tendencies toward grouping. One of these includes sites where the cultural materials were associated with the surface turf, either within it or immediately beneath a thin, superficial layer of lichens and heath vegetation. This group consists of BS-2 and 5, Loup-2, Modeste-1, Pinware W-3, Gold Cove-1 and 2, and Brown's Cove. The remains at BS-2 and 5 and Loup-2 were found very close to the surface, covered only by the sparsest vegetation, whereas in other sites of this group the culture was actually incorporated in a surface layer of turf and humus. This could indicate a difference in the age of the sites, although one might also maintain that members of this group were coeval and that the varying depths of soil cover are attributable to local environmental factors that affected the growth-rate of vegetation.

The second group of sites, generally situated at lower elevations, includes BS-1, 4; FB-1, 3, 4; Loup-1; Diable-1, 2; Pinware E-1, 2; and Portland Creek. These are characterized by extensive sandy deposits, widespread duning and wind erosion, and complex profiles. Some of the profiles contain several buried turf lines, and it is always the lowermost of these that holds the cultural materials. In one more or less standard version there is a major buried turf, ranging to 10 inches in thickness, and the culture, when found there *in situ*, is in the basal layer of this turf.

In areas surrounding these sites there is only a single turf layer, the present ground surface, and in a number of places this can be seen to merge with the surface turf that covers portions of the site locales. In other spots, however, this same turf dips beneath the dunes that cover the sites and becomes a buried horizon, under as much as 6 feet of drifted sand. It would take a considerable amount of trenching to test the proposition, but I believe the buried, stratified turf lines seen in these sites are equivalent in their total accumulation to the present surface turf which surrounds the eroded site areas. Of course, the combined thickness of turf layers in a

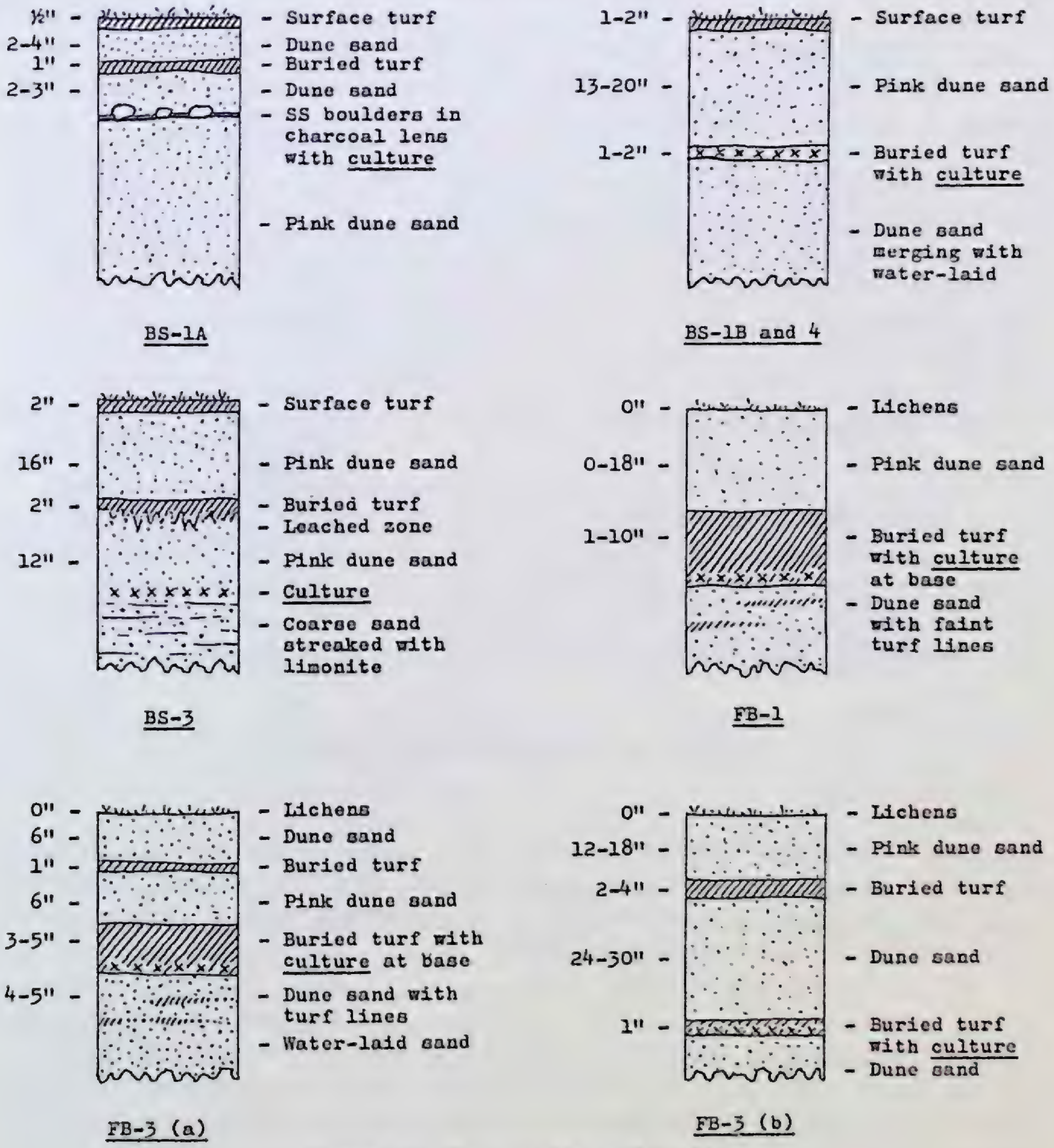


FIGURE 7. Comparative soil profiles.

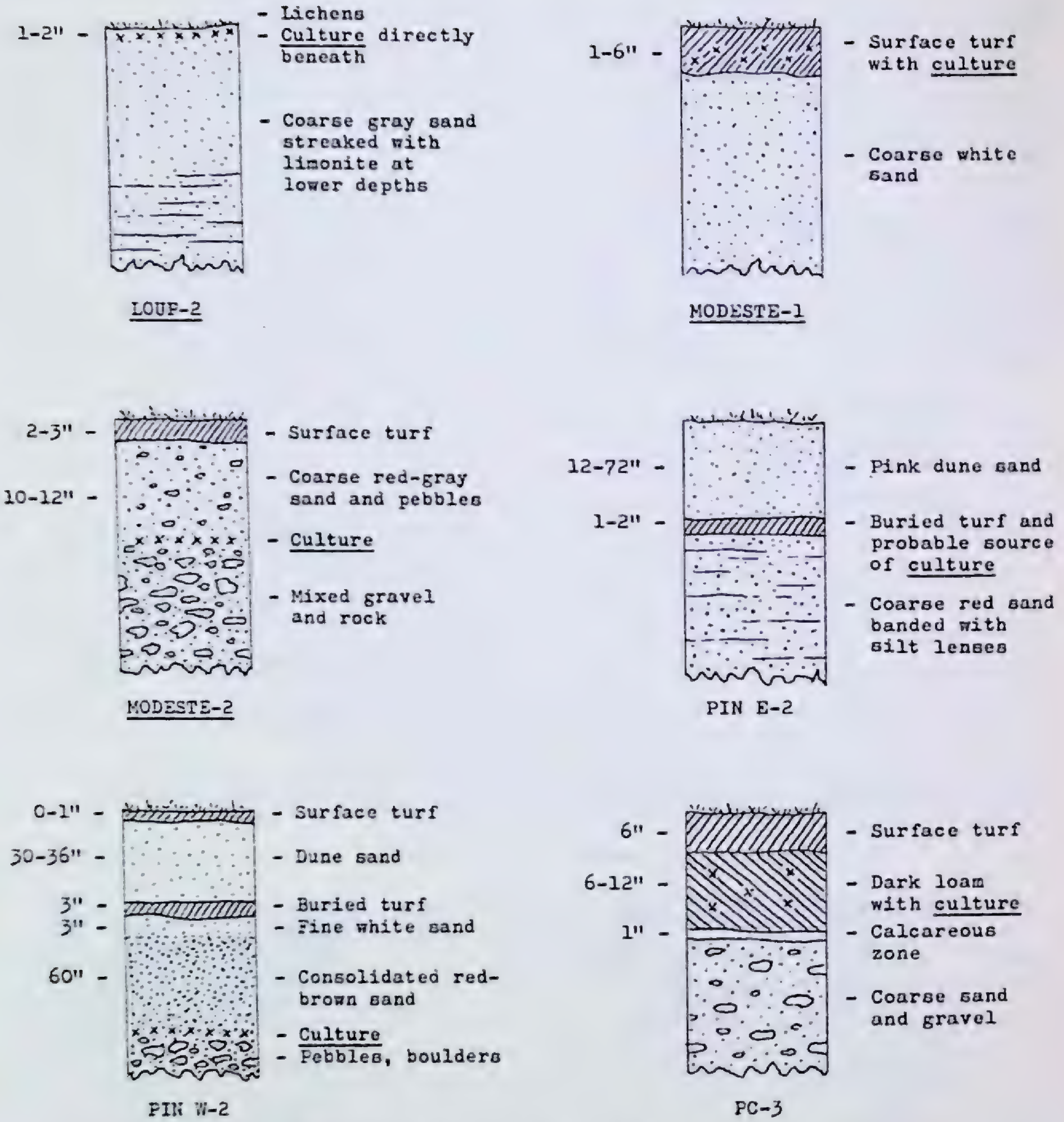


FIGURE 8. Comparative soil profiles.

given column is not necessarily equal in a metric sense to that found in any other column nor in the adjacent surface turf. The measurable differences that do exist may be attributed to variations in the micro-environments that affected growing vegetation.

As we view the region today, it appears that aeolian erosion is associated mainly with locales that have experienced the impact of human habitation. Natural causation no doubt enters this picture, yet I think the most important factor may have been the deforestation wrought by the 'dry' cod fisheries and European settlement patterns of the historic period. Also, judging from the multiple buried turf horizons in the sites and the fact that signs of prehistoric culture are generally found in the lower levels, one may surmise that the aboriginal occupants similarly disturbed the pristine environment.

Several other profiles do not seem at all related to turf horizons, whether at the surface or buried. For example, BS-1A (Figure 7) consisted of a lens of culture found in dune sand some three inches beneath a buried turf line. BS-3 lay even deeper in the local profile, 32 inches below the surface and 12 inches under a buried turf. In this case the culture occurred directly on top of water-laid deposits of coarse sand, while all other superimposed materials were of aeolian origin. Pinware West-2 followed essentially the same pattern, although it included much thicker layers of overburden (Figure 8). Here the cultural remains lay directly on a surface of coarse, water-laid sand, pebbles, and small boulders, and immediately above was a 5-foot stratum of compacted, wind-blown sand.

Modeste-2 is a unique case. The culture, found there on a surface of coarse sand, gravel, and scattered rocks, was covered by 10 to 12 inches of non-aeolian materials. Thus it appears that this site could actually have been established on a post-Glacial raised beachline or other erosional platform, but of course there is nothing to suggest directly that the culture was coeval with this surface during or just after the period of its formation. Furthermore, although knowledge of the chronology of these formations is severely limited, one can reasonably infer on the basis of foregoing discussion that the site was not flooded over by later sea-borne deposits. The only other explanation is solifluction or slope-wash, and judging from the local terrain the latter process was the most likely cause of the coarse overburden.

One other variation in soil profile is shown in Port au Choix-3 (Figure 8). Here the culture appeared in an artificially deepened stratum of loam which was sometimes coincident with the surface and elsewhere was covered by turf. As I have observed at Port au Choix and in other Newfoundland sites which are also situated in or near present-day settlements, this kind of profile results simply from the horticultural practices of the modern inhabitants.

In sum, the evidence derived from soil profiles suggests that several distinguishable phases of culture existed at various times in this region throughout a long continuum. The earliest of these phases may be represented by such sites as Pinware West-2, Modeste-2, and BS-3. Subsequent to these may have been occupations which are now associated with buried turf horizons, particularly those which occur in the basal layers of buried turf, as FB-1, 3, and others. And, finally, there are several whose high position in the profile may indicate relative lateness.

ARTIFACT ANALYSIS

Adequate analysis of the collections is difficult because most of the cultural materials were gathered on the surface, and there is also wide quantitative variation in the yields from the various sites. Hence, with one or two exceptions, there is probably no accurate sample of archaeological content, and it is quite unlikely that one can establish either the summary character of any artifact complexes or the frequency distributions of their component traits. For the same reasons it is not easy to develop a refined classification. Basic distinctions can be made with regard to form, function, material, and technique of manufacture, but the moment one begins to rarefy these, all semblance of relationship is lost, and the number of separate tool complexes is unrealistically multiplied. Therefore, I have held the discrete types to a minimum.

Table 1 applies this simplified classification to a seriation of sites that is derived from the previous discussion of soil profiles. According to that analysis, the group of five sites clustered at the left represents a possible early stage in a hypothetical continuum. At the extreme right of the table two sites are correspondingly thought to represent the latest stage, and in the centre is a large block of sites covering the intermediate stages of the continuum. The object of this procedure is to see if typological considerations corroborate or negate the chronological inferences derived from analysis of the soil profiles.

The left group of five sites, purported to represent an early stage, is not entirely convincing from a typological point of view. It is based on three sites, Modeste-2, Pinware West-2, and BS-3, which have been directly related to known soil profiles and where, at least in the case of Pinware West-2, there are indications of great age in specimens that have degenerated to tripoli. I have arbitrarily added Deer Lake and Woody Point to this group because of the approximate resemblance of finds made there; however, the latter sites are poorly known and lack certain provenience data. There is some degree of internal consistency to this group, and when artificially separated from the other sites it seems to form a discrete set. At the same time, it must be noted that its specific traits are not infallibly diagnostic, for they also occur in most of the intermediate-range sites in the middle bloc of Figure 9. Members of this first group clearly do not have the complex tool and weapon inventories that are characteristic of the middle-range sites, and they also lack ground and polished tools. This suggests cultural simplicity, but it could also result from unknown selective factors that governed the deposition of material in these sites.

The next set, based on FB-3 and FB-1, contains sites that may fall within the intermediate segments of the regional continuum. The evidence from these sites, particularly those in the Forteau Bay area, is quantitatively richer, and there is a greater range of types in the known inventories. They include a notable proliferation of projectile point types and a well-developed series of ground and polished implements. Using the latter as diagnostic traits, one can immediately group eight of the sites, and the similarities of projectile point and other biface types seem to form a reliable thread of continuity to other suggested members of the group. The strength of this relationship diminishes toward the right in Figure 9. At that end of the range are several sites which lack strong diagnostic traits, but I have included them here because of their close geographic juxtaposition to other members of the group.

TABLE 1. Distribution of artifact types.

	MOD. 2	PIN W-2	BS 3	DEER L.	WOODY PT.	FB 3	FB 1	PC 3	PIN E-2	DIABLE 1	BROWNS COVE	PIN W-5	GC 2	LOUP 2	PC 9	BS 1	FB 4	BS 5	BS 6	BS 2	BS 4	LOUP 1	GC 1	PORT CRK.	DIABLE 2	MOD. 3	IRLD. BT	PIN E-1	MOD. 1	PIN W-3
A) *CHIPPED POINTS*																														
Leaf-shaped							X	X			X			X			X								X					
Triangular																													X	X
Lanceolate			X			X	X				X			X		X						X	X							
Stemmed	X	X		X	X	X	X		X	X				X		X	X	X												
Side-notched						X	X	X				X				X	X		X		X				X					
Corner-notched							X	X						X				X		X										
KNIVES																														
Leaf-shaped			X			X	X	X		X				X	X	X				X	X			X			X		X	
Lanceolate																X			X											
Stemmed																				X										
Ovoid						X	X				X						X		X										X	
Asymmetric	X	X				X	X	X		X	X						X	X		X	X	X				X	X			
Amorphous	X					X	X			X		X							X				X	X						
SCRAPERS																														
Snub-nosed	X					X			X					X			X													
End-of-blade						X	X																							
Side								X																						
Turtleback						X																				X				
Amorphous	X					X	X	X	X	X				X		X		X	X	X	X		X		X				X	X
MISCELLANEOUS																														
Drill						X				X																				
Burin-graver						X																								
Chopper									X							X	X	X						X						
Adze, rectang						X				X																				
Adze, triang							X								X															
Prismatic blade						X						X				X	X		X											
Block core						X	X															X								
Pebble core														X		X		X										X		X
Hammerstone						X				X				X																
Hone																										X				
Gunflint																		X												
A) GROUND & POLISHED POINTS																														
Stemmed						X	X		X																					
Side-notched									X																					
KNIVES																														
Lanceolate							X																							
SCRAPERS																														
Bevelled						X		X																						
ADZES																														
Trianguloid										X			X																	
Rectanguloid							X		X																					
Ovoid								X				X																		
Plano-convex								X	X																					
Humpbacked							X		X																					
GOUGES																														
Trianguloid						X		X																						
Plano-convex						X		X			X																			

At the extreme right in Table 1 are two sites which differ from all others in their possession of triangular points. On this basis alone they constitute a separate grouping, and judging from the characteristics of their soil profiles I have suggested that they represent the latest stage of the general cultural continuum found in this region.

In reviewing the large assemblage of so-called intermediate-range sites, it seems that the widely varied evidence could in itself encompass the entire aboriginal continuum in Newfoundland and Labrador, exclusive of the Eskimos and perhaps of some late Indian stages. For example, it incorporates types such as lanceolate and stemmed points which, on other grounds, are suggested to be early. Also, it includes such phenomena as a gunflint, which could of course be intrusive, and the scraper of chipped bottle glass at Diable-1. Both of these occurrences obviously denote the contact period. I believe that several phases are inherent in this set, as suggested by the rather distinctive point types that appear in such components as Diable-1, BS-2, BS-5, and probably Pinware West-5. However, owing to the limitations of the internal artifactual evidence, distinctions of this finer order cannot be made.

Possibly the radiocarbon age determinations, to be run at the University of Pennsylvania through the kindness of Dr. Froelich G. Rainey, will clarify this problem. Nine samples have been submitted for analysis from the following sites: BS-1, Profile A and Profile B; BS-3, BS-4, FB-1, FB-3 (three samples), and FB-4. As stated before, all were obtained from various culture-bearing horizons, but only one, from BS-4, was associated with diagnostic artifacts. Nevertheless, the laboratory readings will be helpful if they give any more exact concept of the beginning and end of the regional continuum. In the meantime it is interesting to note that, in broad terms, typological seriation tends to support, rather than oppose, the relative chronology based on soil profiles.

External Relationships

Since the appearance of Byers' recent paper (1959), which so excellently summarizes all northeastern manifestations of the Archaic stage, the task of relating materials from southern Labrador and Newfoundland to a surrounding cultural context has been immeasurably simplified. I can add no embellishment at all to Byers' analysis, and his identification of the southern Labrador sites with the Boreal Archaic is perfectly sound (*ibid.*, p. 252). However, with the larger collections now at hand it may be fruitful to make several further brief comparisons and to examine the fit of these materials with his hypothetical Early and Late Boreal Archaic phases.

First, it is worth pointing out that the southern Labrador sites serve as a definite intermediate link between the 'old stone culture' of northeastern Labrador (Strong, 1930) and the rest of the northeastern Boreal Archaic, for the sites in the Nain-Hopedale area are in many ways closely similar to those I have examined. In particular, Strong's two coastal sites, Sharp Hill and Windy Tickle, share a number of traits with the coastal sites of southern Labrador, including lanceolate, stemmed, and corner-notched points, chipped semi-lunar (or asymmetric) knives, plano-convex adzes, and gouges. I am also interested to note that the small triangular points with tapering stems from Windy Tickle (*ibid.*, Plate 4: n, o, q–t) are much like those from Diable-1 (my Pl. VII: i–k), for the latter site, it will be recalled, also produced evidence of the contact period. Strong's third site, Northwest Corners, was situated in the interior at a caribou crossing and thus differed in its probable subsistence orientation from the coastal sites in southern Labrador. However, Northwest Corners was characterized by larger and heavier stemmed points (Strong, 1930, Pl. 3: a–g), which have exact counterparts in several of the Strait of Belle Isle sites. Bird's fragmentary specimens of corner-notched points from the Avertok site at Hopedale (1945, p. 152–3 and Fig. 22) further substantiate the general linkage. Therefore, it seems unquestionable that the northern and southern Labrador Archaic sites were closely related.

Bird's discussion of the Avertok collection (op. cit.) emphasizes a minor unknown which may be significant for the internal, cultural cohesion of the Boreal Archaic, i.e., the widespread and persistent occurrence throughout the marginal northeast of translucent grey quartzite as a major raw material for chipped artifacts. Under the name of translucent chalcedony, this was the predominant material in Strong's sites (1930, p. 128), and my collections from southern Labrador and Newfoundland also include numerous examples of it, particularly from Forteau Bay, Pinware East-2, and the Port au Choix-3 cache. Willoughby (1935, Fig. 31) illustrated a set of points and knives that not only are strikingly similar to southern Labrador and Newfoundland types, but are also chipped from "translucent quartz" [*sic*]. The largest specimen shown came from Rhode Island and the others from Maine. Moorehead (1922, Fig. 48) published some of the same specimens, calling the material clear quartzite, or Labrador stone, and Smith (1948, p. 34–37) stressed the distinctive use of translucent, grey-blue quartzite for the manufacture of chipped blades associated with the Maine Cemetery Complex. Byers (1959, p. 252) noted that the source of this material was still unknown and suggested that it might have been transported from Labrador by Pleistocene glacial action.

Recently I learned from conversations with Dr. A. P. Beavan, Managing Director of British Newfoundland Exploration Limited, that a zone of translucent grey quartzite had been discovered by his field parties in the vicinity of Ramah Bay in northern Labrador. The material is known locally as *tunnuyakh*, and a trace of it begins somewhere around Quartzite Mountain in latitude 59° N. and extends southeastward toward Saglek Fjord (*see* Canadian National Topographic System, Hebron – Cape Territok, Sheet 14 N.W.). It is possible, of course, that other sources of translucent grey quartzite may some time be discovered elsewhere in the region, but this particular one is still unique after considerable modern exploration for mineral potential in Labrador. If it was indeed the sole source of this material for all Boreal Archaic cultures in the northeast, I would infer that human travel and trade must also have been responsible for its dispersal southward as far as Rhode Island, for I doubt that glacial transport could have carried it quite that far. In any case, the Ramah Bay occurrence of this quartzite, situated well beyond the northern periphery of known Boreal Archaic culture in Labrador, suggests that similar cultural evidence may possibly be found still farther north, and perhaps westward in the region of Ungava.

As one progresses up the north shore of the St. Lawrence, the Strait of Belle Isle sites continue to show definite affinities with the sporadically known archaeology of Quebec. Gordon Lowther has investigated sites below Tadoussac, and he informed me that specimens from Pointe à Crapeau closely resemble the Port au Choix-3 cache blades, both in type and material. In the classic site area at Tadoussac, Lowther also noted similarities between the bifacial blades found there and at Forteau Bay-3. This further confirms generalized resemblances that I have commented on before (Harp, 1952, p. 290–1). In describing the Tadoussac collections, Wintemberg (1943) specifically mentions that the ground and polished slate blades found there are not related to those known from Maine and the Moorehead complex. However, he does speak of a fragment of polished slate spear point which is diamond-shaped in cross-section (*ibid.*, p. 327), and this sounds very much like the stemmed blades from Forteau Bay.

Sites in south-central Quebec (Rogers and Bradley, 1953) also share a number of traits in common with the Strait of Belle Isle sites. Among these (*ibid.*, Fig. 55) are side-notched and stemmed points, and scrapers, gouges, chipped adzes, and large leaf-shaped bifaces. Pottery was an important trait associated with these sites too, but I have never found any trace of containers, whether earthenware or steatite, in the Boreal Archaic sites of southern Labrador or Newfoundland. Wintemberg's discovery of pottery in the Bradore area of Quebec, close to the Labrador border, still marks the easternmost-known extension of this trait (Smith, 1929). The single potsherd found at Avertok may possibly have derived from this same area (Bird, 1945, p. 142).

Still farther to the west of Ontario, Wright's distributional analysis of selected Archaic traits (1962) highlights several elements which are basic to the tool complexes of the southern Labrador and Newfoundland sites. For example, according to his plotting of gouge types, those which predominate in eastern Ontario are the same varieties that appear in the Strait of Belle Isle area. He discusses types of ground slate projectile points, and among these his triangular-stemmed variant is most characteristic of southern Labrador and Newfoundland (cf. my Plates IV, V, and VI, and Howley, 1915, Plates XVI, XIX, and XXXVII). I have already mentioned the occurrence of a bevelled bayonet point at Port au Choix-3, and I also observe that Wright's hexagonal stemmed type (1962, Fig. 4) of ground slate bayonet has an exact counterpart in Forteau Bay-3, as illustrated in Plate V: f. Furthermore, he records chipped semilunar blades for Ontario, but they are not described.

It is south of the St. Lawrence, however, particularly in New England, that one finds a relative wealth of Archaic stage culture that closely resembles the finds made in southern Labrador and Newfoundland. As Byers has already made a detailed comparative analysis of these materials, a quick perusal of Moorehead (1922), Willoughby (1935), and B. L. Smith (1929) is sufficient to indicate that many traits are common to both areas. There are minor stylistic differences, to be sure, but a large percentage of the entire inventory of the New England Boreal Archaic is repeated in southern Labrador and Newfoundland. The range of similarities covers various forms of chipped projectile points, including lanceolate, stemmed, side-notched, and corner-notched; large leaf-shaped biface tools; large and small end scrapers; semilunar blades of the chipped variety; ground slate points; pecked and ground adzes and gouges showing varying degrees of polishing from slight to full; net sinkers (Howley, 1915, Pl. XXVII); and so forth. As noted before, I have never found evidence of containers in the Boreal Archaic sites that I have investigated, but Howley illustrates steatite bowls, possibly mortars, at least three of which may be attributable to that same cultural stage in Newfoundland (1915, Pl. XXXII: 3, 4, 5). Traits that do not appear in the Strait of Belle Isle area, to my knowledge, include the bannerstone, ground slate semilunar knife, and the grooved axe. Given this extended set of identities, the general Archaic stage relationship between the areas north and south of the St. Lawrence cannot be doubted.

As for the temporal subdivision of the Boreal Archaic materials from the Strait of Belle Isle area, one should not necessarily expect to find exact correlation with the occupation sequence that Byers has derived from Ellsworth Falls, Maine (1959, p. 243–50). Nevertheless, it appears to me that the full range of material encompasses both his hypothetical Early and Late Boreal Archaic phases. For the early phase one finds such of his diagnostic traits as chipped adze blanks (Forteau Bay-1, Plate III: l); other adzes that show pecking and partial grinding (as in Pinware East-2, Plate IX: f, k; and Gold Cove-2, Plate X: g); polished spear points (Forteau Bay-3, Plates IV, V, and VI); large chipped points with stems or side notches (Forteau Bay-1, Plate III: e; Forteau Bay-3, Plate IV: a; Forteau Bay-4, Plate VI: f–h); and so forth.

For the later phase there is a variety of side-notched points, as well as a plenitude of parallel-sided, stemmed points (Forteau Bay-1 and -3), gouges that are polished over the entire surface (Forteau Bay-3, Plate VI: a; Port au Choix-3, Plate XI: i); as well as general persistence of other forms and techniques of manufacture that may have been characteristic of the early phase.

Certainly there is nothing in the evidence I have presented which substantiates the Ellsworth Falls sequence, but that may be due entirely to the limitations of my data. On the other hand, Byers' analysis does not fully support the tentative chronological breakdown that I have deduced from internal site evidence, inasmuch as the small group of sites that I have suggested to be early includes types which are equally, if not predominantly, at home in his later phase. In view of such discrepancies, one can state with confidence only that a full range of Boreal Archaic culture seems to be represented in southern Labrador and Newfoundland.

A NOTE ON THE BEOTHUK INDIANS

Some years ago (1952) I commented at length on the problem of the extinct Beothuk Indians of Newfoundland and made a brief analysis of their salient cultural characteristics, based on a study of the documents set forth in Howley (1915). At that time I rather harshly criticized Howley's book as a mixture of evidence, but the truth of the matter is that his compendium still stands as our most comprehensive source of information about these people. Since 1915, then, we may be accused of having talked fluently but somewhat aimlessly about the Beothuks, for, aside from Jenness's brief sortie through the Exploits River country (1929), no serious, extended effort has been made to investigate their archaeological remains. At present, therefore, nothing really new can be said about the problem of their identity, but I should like to reaffirm several previously stated convictions.

First, it is clear from Howley's transcription of early narratives that, beginning in the first years of the seventeenth century when John Guy established an English colony in Newfoundland, there are observant and seemingly accurate reports of the native Indians, and from that time forward there is general substantive agreement in most such descriptions. The inescapable conclusion to be derived from these reports is that the Beothuks had a *taiga* economy and adaptation. They followed a summer-winter cycle of fishing and sealing on the coast and caribou hunting in the interior. They made extensive use of birchbark for canoes, tipis, and containers, and wore moccasins, leggings, and other garments of animal skins. Other traits could be added to this list, but, in short, the Beothuks appear to have been culturally akin to other Indian groups of the northeastern woodlands, at least to those of the contact period.

Second, the archaeology described in this paper shows quite conclusively that a Boreal Archaic stage of culture also existed in Newfoundland, presumably during an earlier period. The problem now is that there is no positive archaeological picture of Beothuk culture, and hence one cannot correlate it exactly with any ancestral stage, whether Boreal Archaic or otherwise. The Beothuks are likely to remain an enigma until one or more of their occupation sites dating from the contact period, and the protohistoric period as well, have been scientifically excavated.

However, if one assumes without exact proof that recent northeastern woodland cultures evolved from an earlier Boreal Archaic stage, it is equally reasonable to suppose that ultimately the Beothuks may also be traced to a similar antecedent base. In fact, if one also assumes that a time-lag characterized the diffusion of Boreal Archaic culture into the Strait of Belle Isle area, one may find that the Beothuks were culturally and chronologically closer to this basic stage than were any other northeastern aborigines of the colonial period.

SUMMARY

Thirty-two prehistoric occupation and workshop sites, investigated on the Strait of Belle Isle coast of southern Labrador and in adjacent portions of western Newfoundland, yielded evidence of a cultural continuum which typologically relates to and encompasses the known Boreal Archaic stage manifestations in northeastern North America. Analysis of the collections suggests that a pre-Boreal Archaic stage may have been present in the area, and affirms that the latest phase of the continuum probably extended into the contact period. Forthcoming radiocarbon age determinations may further enhance the perspective of this area.

There is nothing in the known tool complexes to suggest clearly the economic orientation of the sites, but it may be, as Strong has noted (1930, p. 128), that some of the larger stemmed points were peculiarly adapted to the spearing or harpooning of large game and sea mammals. However, the close association of most sites with the sea-coast surely bespeaks a littoral economy, and despite the lack of organic evidence one may infer that fishing and seal-hunting were major seasonal pursuits. If so, the sites must have been occupied during the closing months of winter and in early spring when the Gulf of St. Lawrence seal herds whelp on the retreating ice, and probably also in early summer during the time of the salmon runs. In other seasons caribou-hunting may have been a key occupation in the interior, although the inland archaeology is essentially unknown.

It is further suggested that the Boreal Archaic stage in this area was the base from which the historic Beothuk Indian culture of Newfoundland ultimately evolved.

RÉSUMÉ

Au cours des étés de 1949, 1950 et 1961, trente-deux gisements préhistoriques d'occupation et de chantier ont fait l'objet de fouilles en bordure du détroit de Belle-Isle sur la côte sud du Labrador et sur les côtes voisines de l'île de Terre-Neuve. Ces gisements font partie d'un continuum culturel apparenté au vaste champ de la période boréale archaïque dans le nord-est de l'Amérique du Nord. L'étude détaillée des preuves intrinsèques, y compris l'altitude des gisements au-dessus du niveau de la mer, les profils du sol et les collections d'objets ouvrés, permet de croire qu'il ait pu y avoir une période archaïque préboréale dans cette région et confirme que la dernière phase du continuum s'est probablement prolongée jusqu'à la période de contact avec les Européens. Les datations par la méthode du carbone-14 qui seront faites plus tard, pourraient élargir davantage notre perspective archéologique dans cette région.

On n'a pas trouvé de matières organiques dans ces gisements et il n'y a rien dans les complexes d'outils repérés qui indique clairement le genre d'économie ayant régné à ces endroits. D'après la situation côtière de la plupart des gisements, on peut toutefois supposer que la pêche et la chasse au phoque constituaient les principales occupations. S'il en était ainsi, ces lieux devaient être occupés à la fin de l'hiver et au début du printemps,

alors que les bandes de phoques du golfe Saint-Laurent donnent naissance à leurs petits sur les glaces flottantes, et probablement aussi au début de l'été pendant la période de la montée du saumon. Pendant les autres saisons, la chasse au caribou a peut-être joué un rôle important à l'intérieur, mais l'archéologie de l'intérieur n'est pas connue.

On suppose de plus que c'est la période boréale archaïque de cette région qui a été à l'origine de la culture indienne historique des Béothuks qui s'est finalement développée dans l'île de Terre-Neuve.

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